FIRE ENGINEERING

The Journal of the Fire Protection Profession Since 1877

SEPTEMBER, 1953

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FIRE CHIEFS' CONFERENCE AND BUYERS' GUIDE ISSUE

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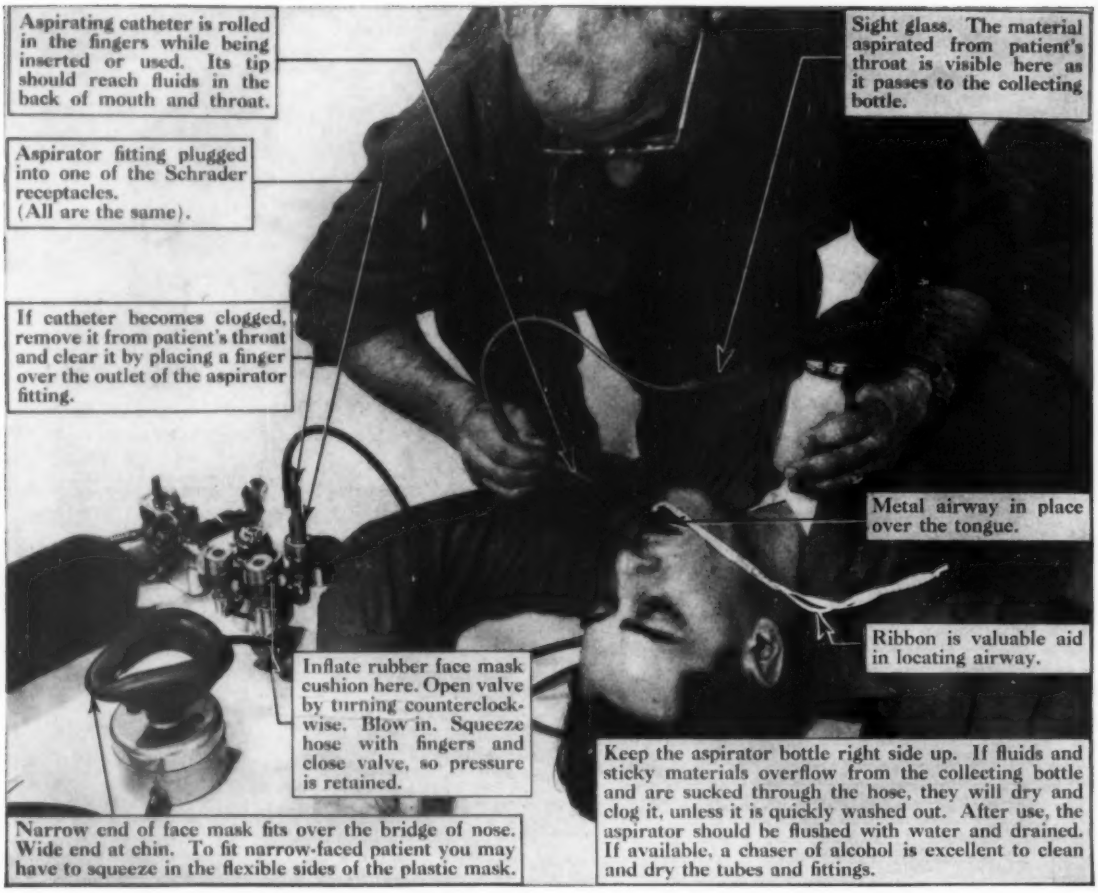
NEW


Aspirating catheter is rolled in the fingers while being inserted or used. Its tip should reach fluids in the back of mouth and throat.
Aspirator fitting plugged into one of the Schrader receptacles. (All are the same).
If catheter becomes clogged, remove it from patient's throat and clear it by placing a finger over the outlet of the aspirator fitting.
Sight glass. The material aspirated from patient's throat is visible here as it passes to the collecting bottle.
Metal airway in place over the tongue.
Ribbon is valuable aid in locating airway.
Inflate rubber face mask cushion here. Open valve by turning counterclockwise. Blow in. Squeeze hose with fingers and close valve, so pressure is retained.
Keep the aspirator bottle right side up. If fluids and sticky materials overflow from the collecting bottle and are sucked through the hose, they will dry and clog it, unless it is quickly washed out. After use, the aspirator should be flushed with water and drained. If available, a chaser of alcohol is excellent to clean and dry the tubes and fittings.
Narrow end of face mask fits over the bridge of nose. Wide end at chin. To fit narrow-faced patient you may have to squeeze in the flexible sides of the plastic mask.

Illustrated Booklet on Resuscitation

Write at the earliest opportunity

for your copy

with the compliments of

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FIRE MASTER Corporation of Mt. Clemens, Mich., built this pumper with 500 gpm 3 stage high pressure pump in heated compartment, 800 gallon booster tank, and 2 Hannay High pressure booster hose reels in heated compartment. Federal model 66 Siren on fender and famous Beacon Ray light on cab roof.

This ultra-modern apparatus is protected from accident by its own zone of safety provided by Federal warning signals. Visual as well as aural signals give a depth of protection unequalled. The Federal Coaster Siren's authoritative roar pierces high-level traffic noises setting up a state of emergency—Federal's famous Beacon-Ray pin-points the center of the emergency, the vital, speeding truck; and the Beacon Ray's 360° swinging arc creates a moving island of protection. As in the manufacture of ultra-modern fire-fighting equipment Federal Enterprises in the manufacture of warning signal equipment has established a national reputation for the finest and most modern.

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and extends a cordial invitation to visit the Federal booth while attending the I. A. F. C. Conference.

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FIRE ENGINEERING

A Consolidation of FIRE AND WATER ENGINEERING, THE FIRE ENGINEER, FIRE PROTECTION *and* FIRE SERVICE

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FRED SHEPPERD
Editor

MEMBER
AUDITED PAID CIRCULATION ABC ABP

ROI B. WOOLLEY
Assistant Editor

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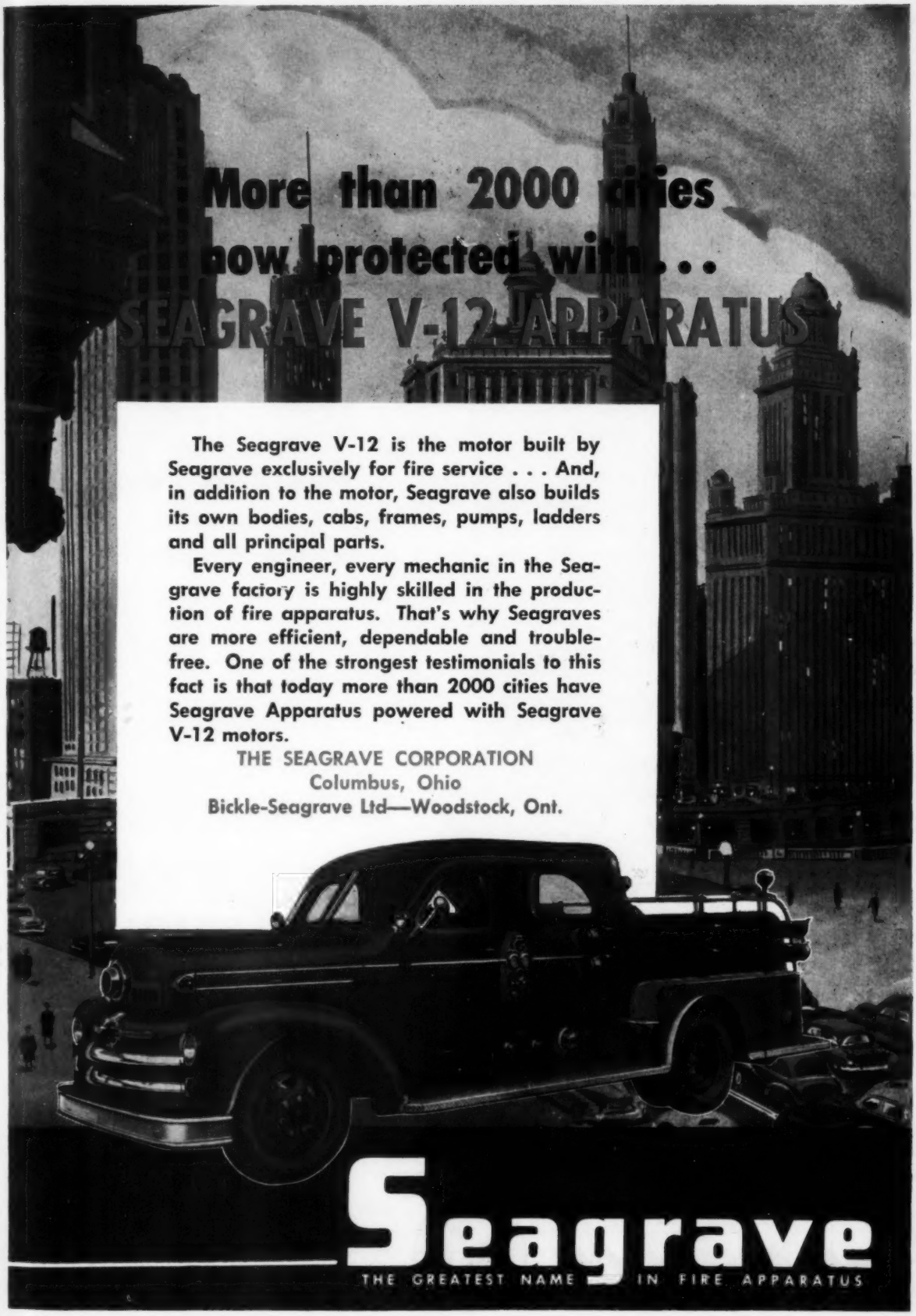

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Develops pressures over 100 psi!
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Delivers fog, stream, or foam!
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Discharge Pressure PSI	10	20	30	40	50	60	70	80	90	100
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U.S. Gal. Per Minute	250	227	197	164	130	101	78	54	38	25

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With all its lightness and ease of handling, actual service tests prove that B. F. Goodrich Fire King, tested to 600 pounds pressure, is *50% stronger* than standard hose, tested to only 400 pounds pressure.

The above picture, taken at Merrill, Wisconsin, shows dramatically the difference in weight between the B. F. Goodrich Fire King and the heavier, bulkier "two-hand" ordinary hose shown at the right—*both* being 50-foot lengths. Asst. Chief Wesley Turbin says: "We have other hose, too, but Fire King is the most flexible and best loading hose in the department."

Next time you're in the market for hose, ask your B. F. Goodrich Fire Hose Distributor for a sample of Fire King and compare it with your present hose—for weight, flexibility, and "rackability". You'll be convinced it is your best hose buy.

The B. F. Goodrich Company
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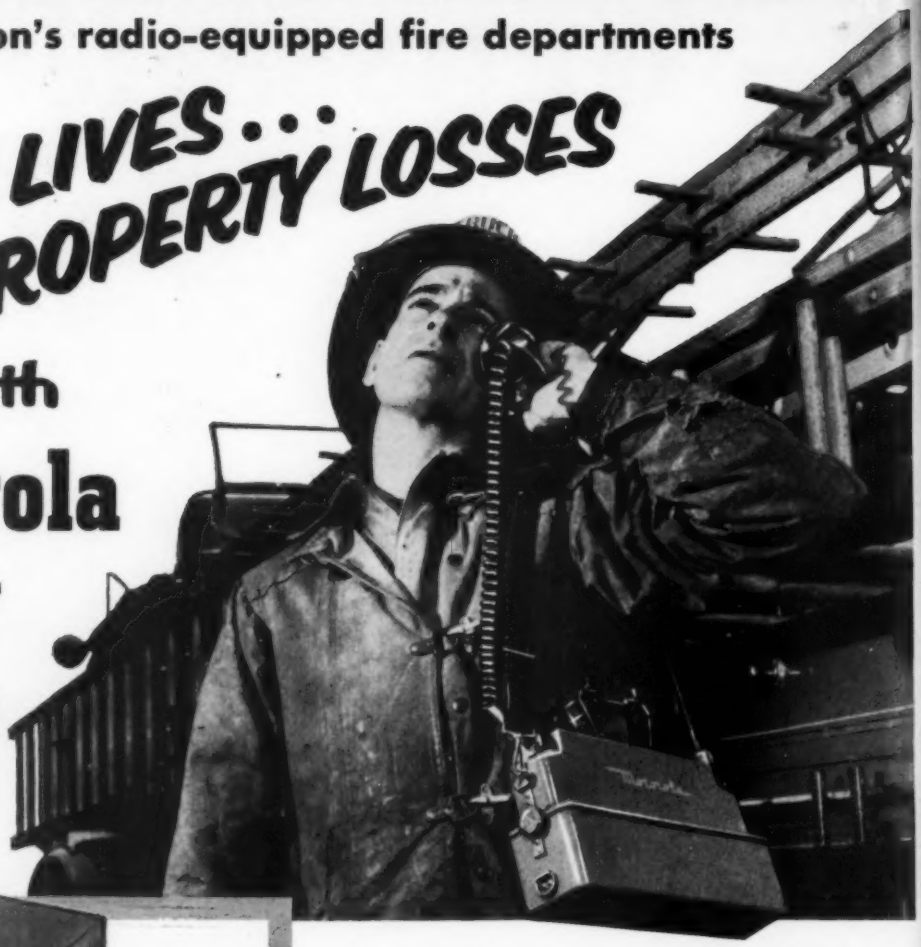

Uni-Channel Sensicon Dispatcher can be used as fixed or mobile unit. It serves as a base for portable units without tying up command cars . . . it's always ready for immediate use.

Handie-Talkie® . . . takes two-way contact anywhere. It's lightweight and rugged. Just slip on shoulder strap, and it gives immediate communication with headquarters.

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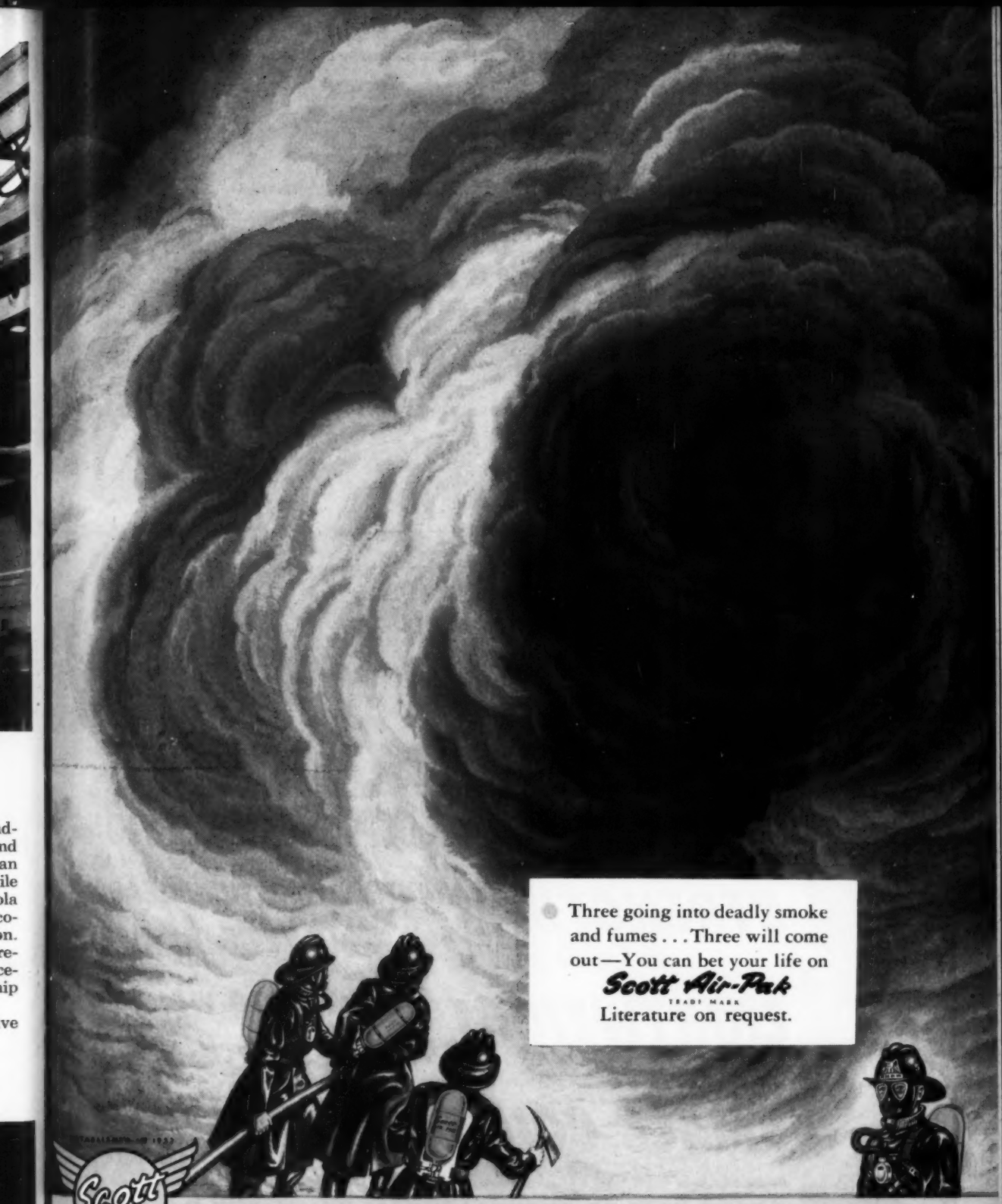

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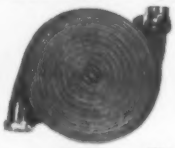

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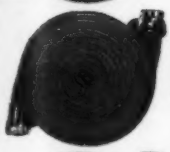

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SUDDEN PRESSURE CANNOT INJURE

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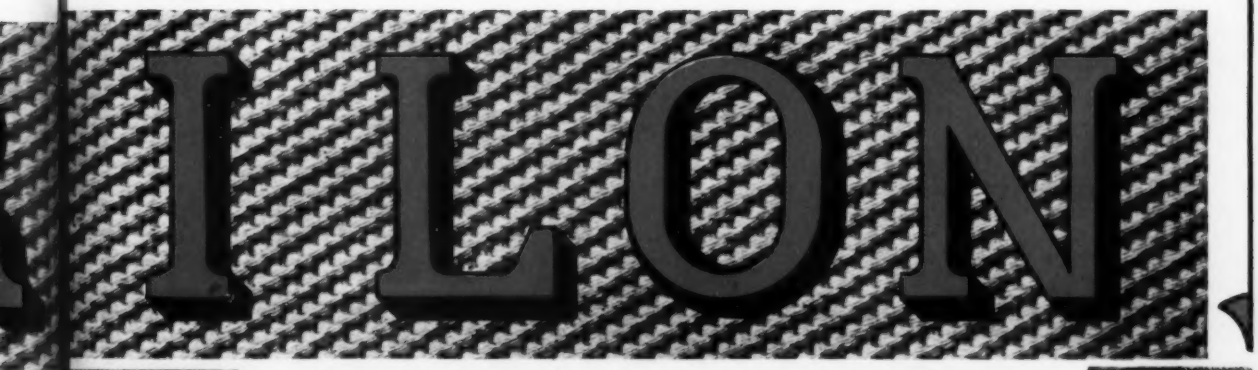

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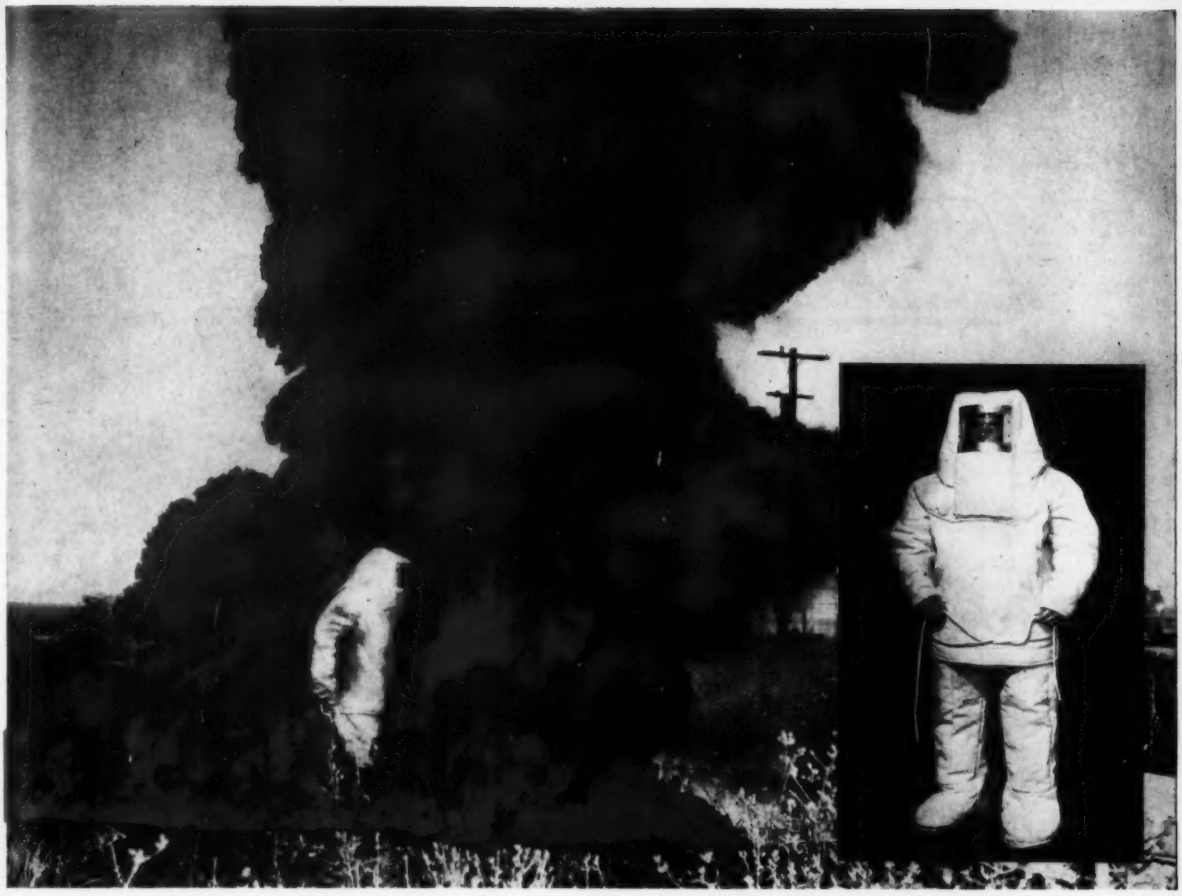

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A Scientifically Built Safety Suit

For Faster, Safer, Rescue and Fire Attack!

Fire fighters who daily come to grips with fire in all its forms and horrors know how often a rescue could have been made, or the heart of a fire reached and knocked out, if only they could have penetrated the fire's heat and flames — even for a few minutes. How many times they've said: "If we only had a *usable, workable,* protective garment that would help us defy that heat!"

That was yesterday; Today, the fire service has the answer to that wish. At last there is a safety suit for fire fighters and those who work around heat, in every category — municipal, industrial, institutional and armed forces. It is as scientifically modern as water-fog and wet-water; it is as easy to get in and out of as the latest respiratory protective equipment; it is unlike any safety suit ever made.

The secret lies in its scientific application of the newest, greatest insulators against heat: asbestos, fibre glass; vinyl treated glass cloth, and aluminum foil, all built into a garment to safeguard wearers in temperatures ranging from 350 deg. F. to 1800 deg. F.

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For data on Breathing Equipment see page 738.

Write now for complete details and prices.

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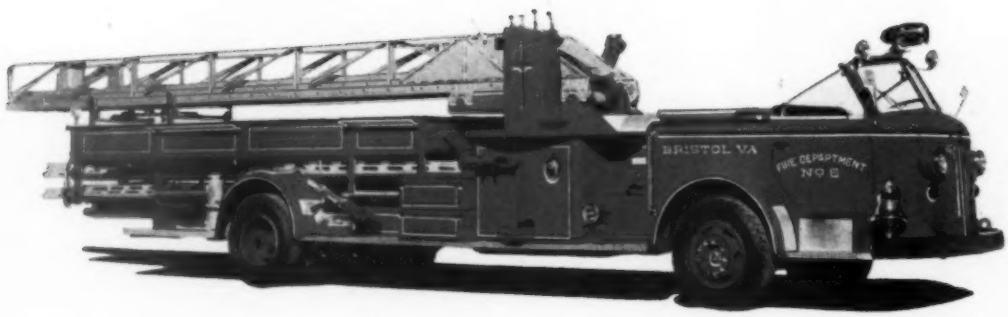

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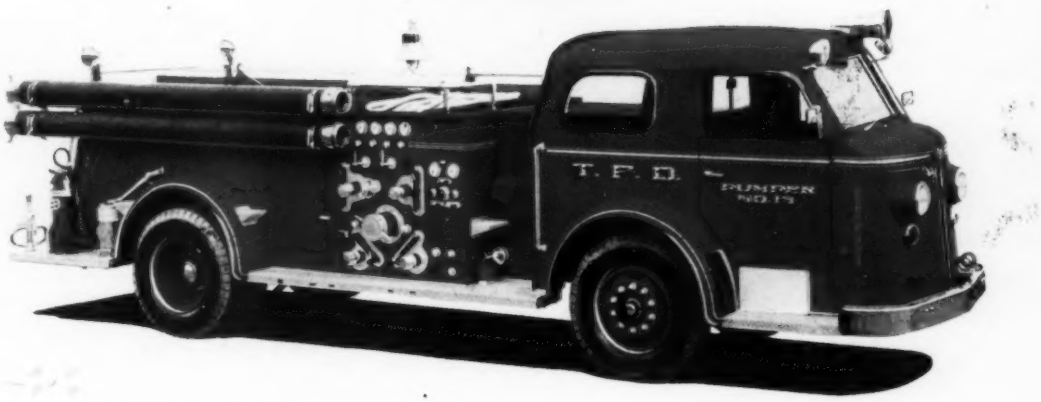

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Pumpers are available in all standard rated capacities—Class A or B. Triple combination or as quadruple combination with a full complement of ground ladders. There are 14 Extra Value features for superior performance and longer service life.

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  See our Aerial in Space #11

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Toronto is just one of many cities where Leece-Neville Alternators are helping fight fires and save lives. You'll find them in New York, Los Angeles, Denver, Dallas, Montreal, Quebec and hundreds of other cities, large and small, here and abroad.

It's easy to find the reason for this wide acceptance of the L-N Alternator. More than seven years of performance on many thousands of vehicles has proven the advantages of the Leece-Neville Alternator System in place of the conventional d.c. generator.

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Installation of a Leece-Neville Transformer with the Alternator gives your equipment a source of 110 volt power. You can plug in standard flood lights, search lights, portable saws, drills and other hand tools. Send for special Transformer folder.

There are L-N Alternators for 6 volt systems with capacities to 95 amperes; for 12 volt, up to 180 amperes; and for 24 volt, to 80 amperes. Be sure to specify Leece-Neville Alternators on your new equipment. Write The Leece-Neville Co., Cleveland 14, Ohio. *Custom-Engineered Electric Equipment Since 1909.*

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proved by performance for over 7 years

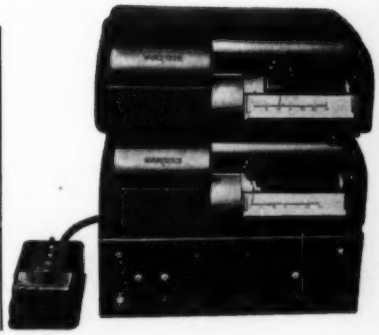
Come in, Policemen, Firemen, Communication Engineers, Everybody who needs monitoring—

The New Dictacord Continuous Recorder is the least expensive and the most versatile improved recording equipment on the market today.

It reproduces and records at the same time, a necessity in many applications. It operates on any power supply from 25 to 400 cycles per second as well as on D. C. It gives sequential recording in convenient takes that can be typed up as the recording proceeds.

Weight: a compact 45 pounds. What's more, it can be operated remotely, and since it uses standard TIME-MASTER equipment, it is easily serviced.

DICTACORD is modeled after the famous TIME-MASTER, world's most successful dictating machine. Like Dictaphone's TIME-MASTER, Dictacord uses the *Dictabelt*, the little red plastic recording medium which is unbreakable and filable—easy to save for future reference. Just as superlatively as the TIME-MASTER itself, the Dictacord dual recorder reproduces all voices with startling fidelity.



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THE GREATEST NAME IN DICTATION

"Dictaphone" is a registered trade-mark of Dictaphone Corporation.

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Rockwood offers you two big advantages. One is long, practical experience in manufacture and in the field. The other is constant research that results in **new** methods and **new** devices to fight fire. These pages show you a few of the many products developed by Rockwood that have a vital part in fire protection programs throughout this country.

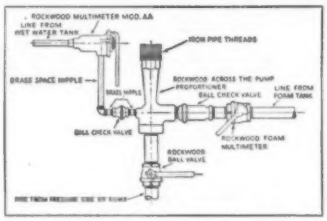
For further details on these products, and many, many others, write for your free copy of the Rockwood Catalog, "Fire Fighting Products." ROCKWOOD SPRINKLER COMPANY, 54 HARLOW STREET, WORCESTER 5, MASS. Distributors in all principal cities.

ROCKWOOD

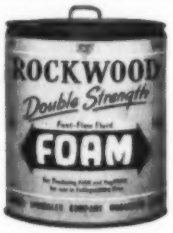
Type FFF FogFOAM Nozzle. Discharges FogFOAM, Solid FOAM stream, and High Velocity WaterFOG.

Type SG-48 WaterFOG Nozzle. Easy to handle. Discharges high or low velocity WaterFOG or straight water stream.

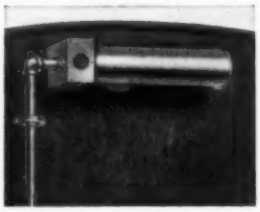
Foam Eductor. Introduces FOAM liquid into hose lines. Used with Type FFF FogFOAM Nozzles.



Proportioning Systems. Used when pressure is maintained by pump. Custom-engineered systems also available.

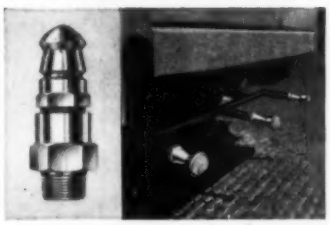


Double Strength Foam Liquid for fire hose line Nozzles and permanently piped FogFOAM and FOAM installations.



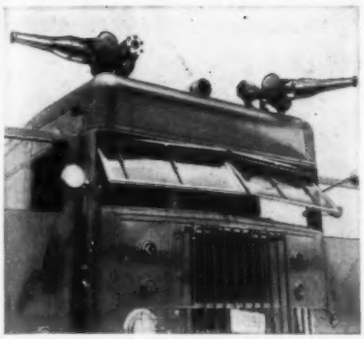
Rockwood Foam Maker and Chamber. Used for fighting flammable liquid tank fires.

Standard Straight Foam Play Pipe and FOAM pick-up tube. Discharges solid FOAM stream.

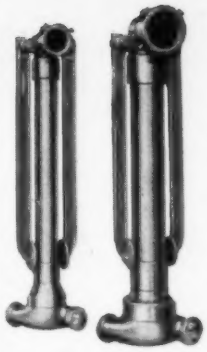


Under Truck and Ground Sweep Nozzles. Used to protect front of fire trucks and parts under trucks.

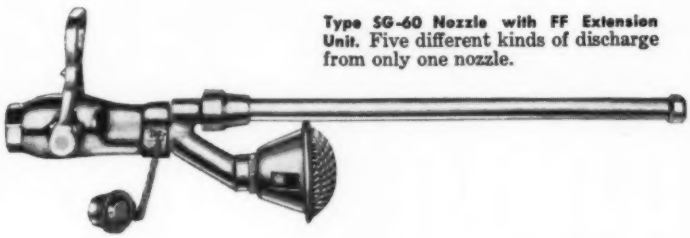
ROCKWOOD
SPRINKLER COMPANY



Hydraulically or Manually Controlled Type FFF FogFOAM Turret Nozzle for airport crash fire fighting trucks and special fire fighting trucks for oil refineries, chemical and industrial plants and municipalities.

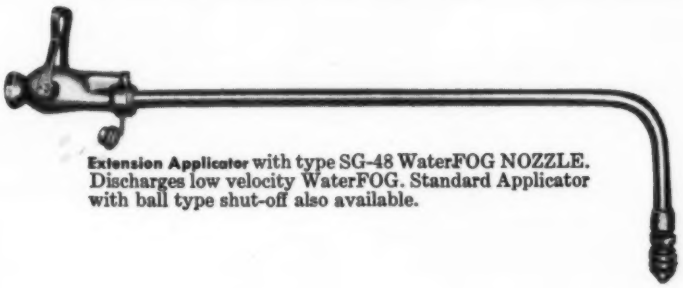


Lightweight Rotating Cellar and Attic Pipe. Fights fires in cellars, attics, under piers, bridges, etc. Also available in a short unit with swivel but without extension barrel.



Type SG-60 Nozzle with FF Extension Unit. Five different kinds of discharge from only one nozzle.

Rockwood Ball Type Shut-Off. Gives operator complete control of water flow from nozzles.

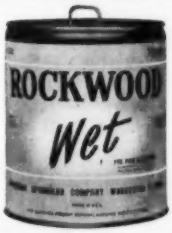


Extension Applicator with type SG-48 WaterFOG NOZZLE. Discharges low velocity WaterFOG. Standard Applicator with ball type shut-off also available.

High Capacity WaterFOG Nozzle. Quickly controls and extinguishes large fires in buildings and flammable liquids.

Type N22 WaterFOG Nozzle. Discharges high velocity WaterFOG. For general use around live electrical equipment.

Rockwood Type N-23 WaterFOG Nozzle with swivel handles. Discharges high velocity WaterFOG with higher discharge, greater range than type N-22 Nozzle.



Rockwood Wet wetting agent. Increases fire extinguishing action of water making a little water go a long way.

Engineers Water . . . to cut fire losses

first in fire fighting

WARD LA FRANCE

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OREN

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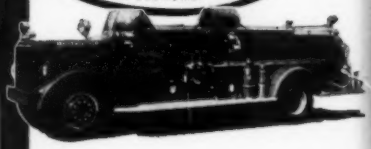
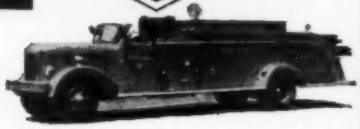


AHRENS-FOX

FWD

THE GENERAL FIRE TRUCK CORP.



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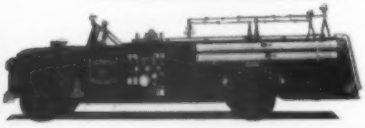

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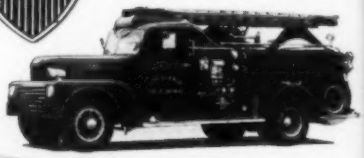
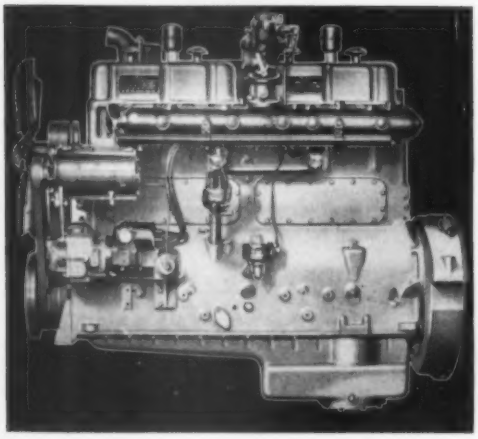


WAUKESHA
MOTOR COMPANY
WAUKESHA, WISCONSIN
New York Tulsa Los Angeles

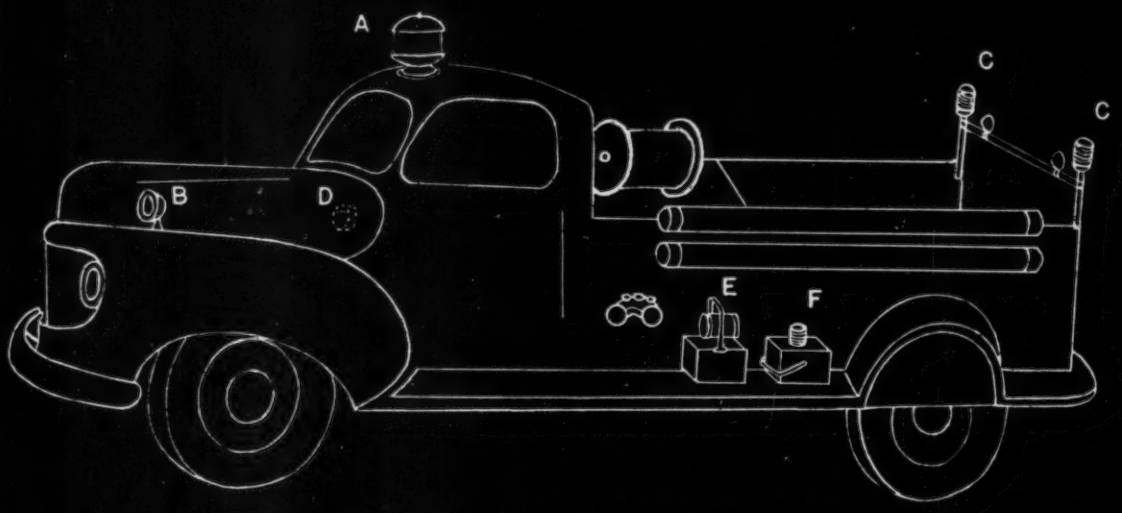


WAUKESHA
FIRE FIGHTER
ENGINES

145-GZB
High Output FIRE FIGHTER ENGINE
six cylinders, 5⅜-in. bore x 6-in. stroke, 817 cu. in. displ., with counterbalanced and vibration dampened 3½-in. 7-bearing hardened crankshaft; dual ignition; precision extra high capacity bearings; overhead valves with Stellite-faced exhaust valves and seats; removable wet sleeve cylinders. Arranged for full electrical equipment and all modern accessories. Send for Bulletin 1594.

221

DESIGN FOR SAFETY



INCREASED HAZARDS OF GETTING VEHICLES THRU TRAFFIC, AND PROTECTION OF MEN AND EQUIPMENT AT FIRES, REQUIRES REVIEW OF THE WHOLE PROBLEM OF ADEQUATE PROTECTIVE LIGHTING.

THIS BLUEPRINT ILLUSTRATES A PIECE OF APPARATUS WITH THE PROPER PERIMETER MARKING AND ALL AROUND HIGH INTENSITY PROTECTION.

A. "CIRCLE BEAM" ALL AROUND SEALED BEAM WARNING LIGHT, NO MOVING PARTS IN LIGHT. LOW BATTERY DRAIN. LONG DURATION BRILLIANT FLASHES. MAY BE MOUNTED ON CAB TOP OR WITH STAFF ON OPEN BODY — TYPE 806-SP.

B. SEALED BEAM - LUCITE LENS - HIGH POWER SINGLE DIRECTION WARNING LIGHTS — TYPE 106 ADSL.

C. ALL AROUND NAVAL LENS HIGH POWER WARNING LIGHTS, FOR REAR & SIDE PROTECTION — TYPE AF-60-6. (AVAILABLE ALSO FOR ROOF MOUNTING).

D. MAGNETIC RELAY FLASHERS — TYPE TG-6-90. GIVES ALTERNATE FLASHING ON WARNING LIGHTS. LONG LIFE, LOW BATTERY DRAIN, — TYPE TG-6-90.

E. SEALED BEAM HIGH EFFICIENCY SPOT — FLOOD BATTERY LIGHT, 7 TO 12 HRS. FLOOD — 2 TO 4 HRS. SPOT. — TYPE A-45-DRD.

F. HIGH INTENSITY NAVAL LENS WARNING LIGHT. BATTERY (DRY CELL) OPERATED. FOR TRAFFIC BLOCKING & HOSE LINES. — TYPE AFL-6-32.

NOTES- CONSULT JULIAN A. MC DERMOTT CORP. ENGINEERING DEP'T. ON ALL SAFETY LIGHTING PROBLEMS.

FILL IN BOX PROVIDED AND MAIL FOR DETAILED SPECIFICATIONS & PRICES → MATERIAL AVAILABLE DIRECTLY OR, THRU YOUR DEALER.

TITLE

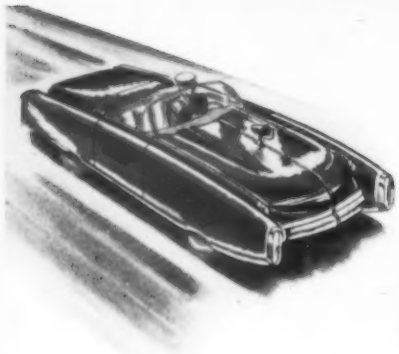
COMPLETE PROTECTIVE LIGHTING FOR FIRE TRUCKS.

DEPARTMENT

JULIAN A. McDERMOTT CORP.

ENGINEERED LIGHTING FOR FIRE FIGHTING

CORONA 68, L.I. NEW YORK CITY



FOR MODERN FIRE
2 GREAT AKRON BRASS

NOW YOUR FIRE FIGHTERS CAN INSTANTLY SELECT AND DELIVER ANY STREAM FASTER AND MORE EFFECTIVELY THAN EVER BEFORE POSSIBLE

AUTOSTREAM

AUTOMATIC — Finger-tip control gives you instant stream selection. Selects the right stream — day or night — without twisting or turning in less than a second.

POSITIVE POSITIONING — Stream selected STAYS PUT. Drop it, hit it, beat it. Autostream nozzle can't pull out of position until YOU move it.

DURABLE — Built of lifetime Akron Brass materials — breakproof handle, shockproof bumper, tough, all brass body. Can't get out of alignment even when dropped or bumped.

NEVER NEEDS SERVICING — Self-lubrication assures maximum performance. Works easily under all weather conditions.

and the NEW FORGED

PATENT PENDING

LIGHT AS A FEATHER

TOUGH AS AN ELEPHANT

AKRON BRASS & FOG NOZZLE

DIVISION

FIRHIEFS...

A NEW S PRODUCTS

A NOZZLE

Selects Any Stream Without Twisting-

Quick as a Wink!

GE COUPLING

he Perfect Mate For our Lightweight Hose

THIS LIGHTWEIGHT UNBREAKABLE HI-TENSILE BRASS DROP FORGED COUPLING MAKES HOSE HANDLING EASIER AND FASTER

LIGHTER — Forgex Couplings make your tough hose handling jobs easier, faster. They're half the weight of a cast coupling.

TOUGHER — Drop it, drag it, even pound it, Forgex Couplings never break. Made on giant forges in dies which control and concentrate grain flow to obtain maximum tensile and impact strength, toughness and wear resistance.

UNCONDITIONALLY GUARANTEED — Every Forgex Coupling is guaranteed to give complete satisfaction.

AMERICA'S FINEST — Contains all the features of The Akron Rockerlug Coupling, used by more fire departments than any other.

See the New Akron Brass Products at IAFC Booth #26

MAIL COUPON FOR FURTHER DETAILS

Akron Brass Mfg. Co., Inc., Wooster, Ohio
Please send without obligation information and prices on the following:

☐ Forgex Coupling ☐ Autostream Nozzle

Name _____

Address _____

City _____ State _____

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ON BRASS

. . . if AIRPORT protection is your problem . . .

we've got the ANSWER!

THE matter of airport protection is one that will definitely interest every fire official—now or later. Where to go for experienced assistance; what to do; what to buy, is not difficult. We shall be glad to show you how effectively we have answered these problems for others.

Airport protection problems vary—and the experienced assistance we offer will give you the type of protection best suited to fill the particular needs of your conditions. All of our apparatus—not only Crash Trucks—but pumpers with 500 to 1250 mid-ship pumps or 500 and 600 with frost-proof front end pumps; power take off pumps 100—200—250 GPM; Hose and Rescue Trucks; Forest Fire Trucks—all are built to FIT A PARTICULAR PROTECTION PROBLEM. We welcome your inquiries.

Crash-Rescue Truck Specifications . . .

Chassis—F-8 Ford; 155 HP; Marmon-Herrington all-wheel drive. Pump—Waterous 2-stage all bronze centrifugal pump; driven by independent engine mounted behind the cab. Foam Equip. — Complete Rockwood fog foam proportioning system; 2 manual turrets, 3 ground sweep nozzles, 2 under-truck nozzles, 2 hand line nozzles, 110 gal. foam tank. Water Tank—1000 gal. capacity. Specifications may be altered to suit customers' requirements.

A. F. ROBINSON • 200 Second Ave., • CAMBRIDGE, MASS.

Robinson
Fire Fighting Apparatus

BE SURE TO SEE

TRADE PERFEX MARK "Ranger"

. . . AT THE I.A.F.C. CONVENTION. BOOTH #64

One of these "Ranger" Chemically Flame Proofed Fire Fighting Brooms at hand in a critical moment can save tremendous fire loss. It combines PERFEX'S 25 years of construction know-how with the best quality materials, adding up to the best you can buy . . . *anywhere!*

It's the best Fire Fighting Broom on the market. The many features, including a metal collar where the handle joins the heavy gauge metal cap to prevent this vulnerable point from charring or breaking, make this a dependable and long lasting tool. Other important features are listed in the edge of the page. The carefully prepared blend of whole and split rattans make this broom acceptable for all types of fire fighting, whether grass or underbrush. The fibres are colored fire department red for easy identification.

- Chemically fire proofed solid Rattan fibres. Colored Fire Department red.
- Riveted into heavy gauge rust proof metal head.
- Strong Hickory handles. Metal re-inforced at all points of stress.
- If your dealer cannot supply you, write, giving your dealer's name and address to:

PERFEX

41 DINSMORE PLACE BROOKLYN 8, N. Y.

MAXIM

America's Finest Fire Apparatus

PUMPERS

for all types of servic
from 500 - 750 - 1000
- 1250 to 1500 G.P.M

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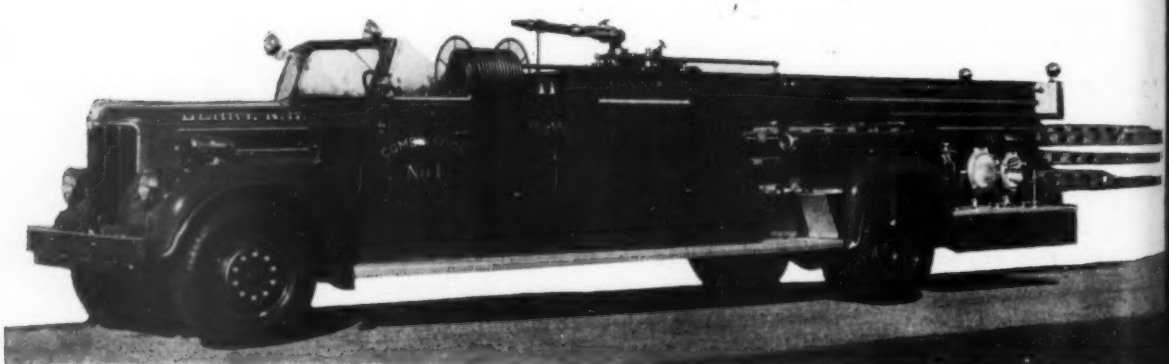
America's Finest Fire Apparatus

QUADRUPLES

in any combination you
choose to cover your
conditions . . . .



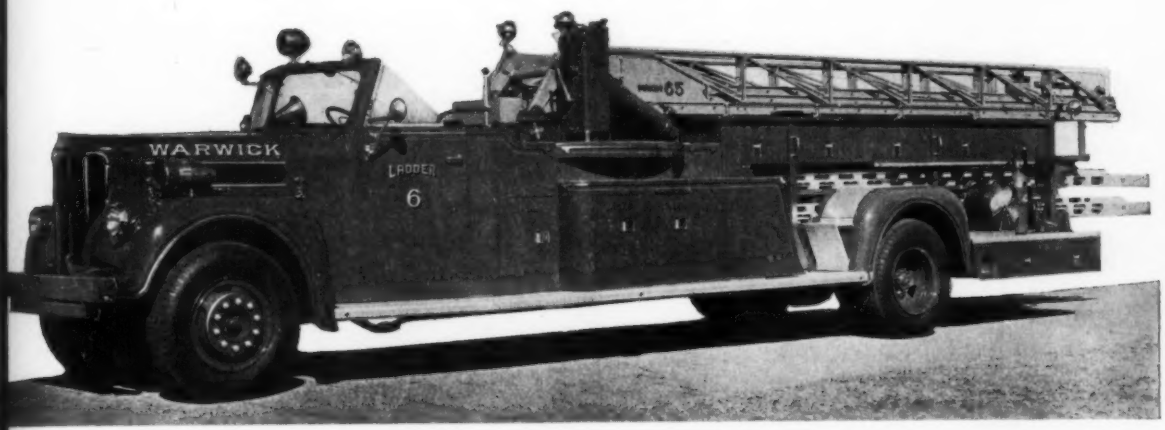
MAXIM MOTOR COMPAN

MAXIM

America's Finest Fire Apparatus

AERIALS

all steel hydraulically controlled from 65 - 75 to 85 feet . . . .



MAXIM

America's Finest Fire Apparatus

RESCUE *and specially engineered crash trucks . . . . 100 to 175 foot Maxim-Magirus rescue aerial . . . .*

MIDDLEBORO, MASSACHUSETTS

take an easier, safer, faster way down

When seconds count there can be no question about speed, but when you can combine *speed* and *safety* and still slide *faster*, we suggest that the old brass pole is outmoded.

Why come down "hanging on" when it is easier and safer "sitting up?" In this way wrenches, sprains, and even broken bones can be avoided without resultant loss of time and manpower. Obviously, accidents are costly. A Potter Slide means no waiting at the top, no danger in descent, and just as fast a take-off at the bottom.

install this POTTER SLIDE

This simple, easy, safe chute eliminates all hazards, can be installed anywhere in the fire station and nobody can get hurt coming down even if he is half asleep. We have installed three of these modern, quick descent slides at Mishawaka, Ind., for Chief Tom Pressler. . . . Send this coupon today for details.

POTTER FIRE ESCAPE COMPANY
6114 N. California Ave.
Chicago 45, Illinois

Gentlemen:

Without obligation we will be glad to know more about the Potter Fire Slide for fire houses.

Name_____

Address_____

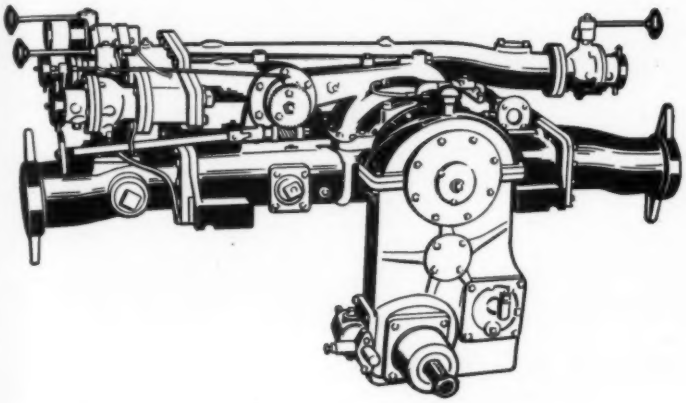
City_____ State_____

VISIT THE FLYNNS AT THE ROYAL YORK DURING THE CONVENTION

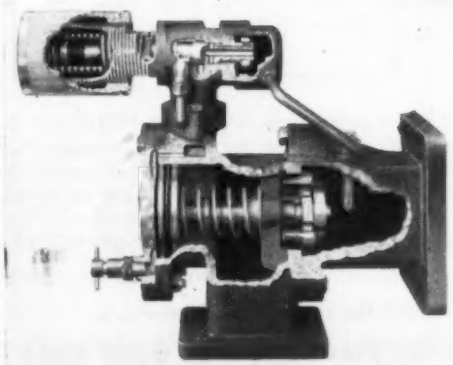
Specify HALE

Because HALE Fire Pumps are known for:

- **DEPENDABILITY AND HIGH EFFICIENCY**
- **FLEXIBLE PERFORMANCE PROVIDING VOLUME AND PRESSURE WHEN NEEDED**
- **CONSTANT RESEARCH RESULTING IN CONSTANT IMPROVEMENT**
- **SOLD ONLY THROUGH MANUFACTURERS OF QUALITY APPARATUS**



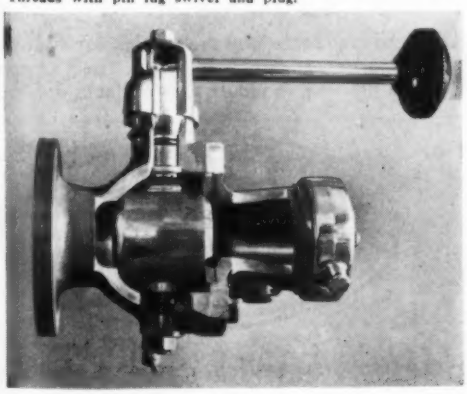
HALE Fire Pumps are built in all standard capacities. They range from the Centrifugal ZMHD 2-stage, Underwriters' rating 1500 U.S.G.P.M. at 150 lbs., down to Type GS Single Stage Centrifugal, Underwriters' ratings 500 and 600 U.S.G.P.M. at 150 lbs.; also rotary Booster Pumps Type HHB, H and 2HB 100 to 200 U.S.G.P.M. at 100 to 200 lbs. pressure.

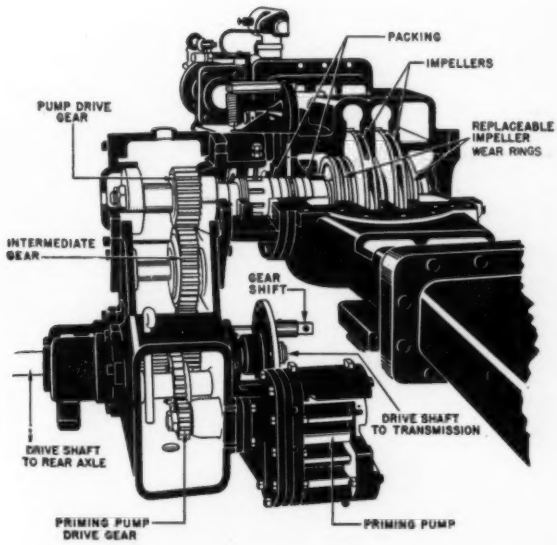


AT TOP—Popular Hale Centrifugal Type ZSF, Underwriters' rating 500 U. S. GPM at 150 lbs. Has Push Button Priming System. The smaller pictures directly above and below show two popular and proved accessories important to the efficient operation of Fire Pumps.

ABOVE—Cut-away view of HALE Ideal Relief Valve.

BELOW—Cut-away view of Hale Type 8L Discharge Valve —also available as Suction Valve with 2½" N.S. Female Threads with pin lug swivel and plug.



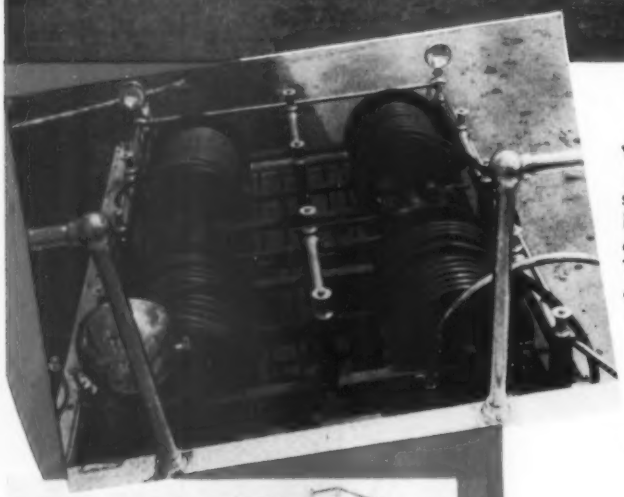


WRITE FOR NEW CIRCULARS AND NEW BULLETINS JUST PRINTED, OF INTEREST TO ALL FIRE FIGHTERS

HALE
FIRE PUMP COMPANY
CONSHOHOCKEN, PA.

In Military as well as Civilian Service HANNAY HOSE REELS are FIRST in Dependability!

Photos show U.S. Coast Guard's Howe Crash Truck, equipped with FOUR Hannay Hose Reels with Explosion-Proof Electric Motors.



You can't buy a better hose reel than a HANNAY! Designed and built by firemen for firemen, Hannay Hose Reels are functionally correct in every detail of construction and service . . . *completely dependable in any emergency.* That is why those who know . . . civilian fire officials and military purchasing agents . . . insist on HANNAY!

Check these superior advantages of

HANNAY ELECTRIC DRIVE HOSE REELS

- Explosion-proof heavy duty motor, protected against fog, foam, fumes and water
- Sealed push button control; no gears to shift, no clutch to engage
- Water and Vapor Resistant
- Extra heavy; built to withstand high pressures
- Safe rewind speed; always under control

When YOU need dependable hose reels, either for standard or special performance, specify HANNAY . . . built to do a better job, in fire fighting, in industry, in national defense!

Crash Truck built by Howe Fire Apparatus Co., Anderson, Indiana

. . . LOOK FOR THIS

HANNAY
REG. U.S. PAT. OFF.
HOSE REELS
CLIFFORD B. HANNAY & SON, INC.
WESTERLO, NEW YORK

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MANUFACTURERS OF MANUAL AND POWER OPERATED HOSE REELS FOR EVERY PURPOSE

Reading, Pa. picks . . .

NEW Reading, Pa. Pumper has all-steel cab, available on all custom built models. Driver's seat is fully adjustable, accommodates three men comfortably.

WARD LaFRANCE

This Ward LaFrance Pumper . . . with its modern all-steel cab . . .
was recently delivered to Reading, Pa.
Why did this progressive Pennsylvania city choose Ward LaFrance?

Because Ward LaFrance Pumpers have long been famous for their fine performance. And deservedly so. For over 30 years, these pumpers have demonstrated their ability to operate under all kinds of fire-fighting conditions.

CHOOSE WARD LA FRANCE YOURSELF Modernize your community's fire department with ruggedly-built Ward LaFrance equipment. Choose from pumpers in 130, 150, 200, 240 and 260 H.P. with the weight-to-horsepower ratio necessary for fast get-aways and hill-climbing. These pumpers are equipped with Waterous split housing pump . . . surplus gallonage far exceeding rated capacity . . . flat horizontal booster tank . . . exceptional hose capacity . . . other outstanding features.

Contact your Ward LaFrance representative. Let him help select the equipment that fits your community's requirements.

J. J. Duffy, Regional Rep.,
1462 Liberty,
Trenton 9, N. J.

WARD LaFRANCE
TRUCK CORPORATION

Fire Apparatus Manufacturers for over 30 Years

GENERAL OFFICE & FACTORY: Grand Central Avenue, Elmira, N.Y. Tel. 3-5631

DIRECT FACTORY BRANCH: 139th Street and Bruckner Boulevard, New York 54, New York. Tel. CYpress 2-3300

EXPORT: Ward LaFrance International, Inc., Elmira, N.Y., U.S.A. Cable Address: "WARDTRUCK"

SEE the Latest in Fire Fighting Sa

AT T

1 M.S.A. PNEOLATOR

ACCEPTED COUNCIL ON PHYSICAL MEDICINE AND REHABILITATION AMERICAN MEDICAL ASSOCIATION

Because the Pneolator is the nearest automatic approach to natural respiration it assures maximum chance of recovery in all cases of arrested breathing. Providing oxygen for the lungs at the pre-selected amount and pressure, the Pneolator breathes for the asphyxiated patient—aids the patient to full recovery. There is no "suction" cycle. Exhalation takes place by the normal passive return of the respiratory muscles. The Pneolator's intermittent positive pressure is effective in treating patients whose lungs are irritated by corrosive gases. Immediate change over to inhalator when the patient starts breathing.

Light in weight, the Pneolator can be conveyed immediately to the patient . . . conserving the vital minutes that may make the difference between recovery and tragedy. Ask for Bulletin No. CH-2, and a demonstration.

NOTE: The first few minutes after breathing has ceased are the most critical. Immediate application of manual artificial respiration should be started and continued until Pneolator is in use.

4 M. S. A. DEMAND MASK

Supplying compressed oxygen or certified pure air from a back-carried cylinder to facepiece, the M.S.A. Demand Mask provides complete breathing protection for a minimum of 30 minutes in toxic or oxygen-deficient atmospheres. Simple to use, completely dependable. U. S. Bureau of Mines Approved. Bulletin No. B-20.

5 M. S. A. DEMAND OXYGEN UNIT

Compact, demand-type breathing apparatus designed for economical administration of oxygen. Completely self-contained, portable. Requires no auxiliary parts or fittings for use. Ideal for application in cases of smoke inhalation, heart failure, and carbon monoxide inhalation. Accepted by the Council on Physical Medicine and Rehabilitation of the American Medical Association.

6 M. S. A. ALL-SERVICE MASK

For fire-fighting efforts in air co taminated with smoke and gas, b where sufficient oxygen is pres to support life, the "All-Servi Mask assures dependable brea ing protection to the wearer. Ava able with the M.S.A. "Clearto Speaking Diaphragm for cle speech transmittal. Bulletin N EA-8.

7 M. S. A. EXPLOSIMETER®

A compact, portable, easy-to- instrument for checking suspec areas for explosive gases a vapors during fires and in gene survey work. Body carrying stra and one hand operation per unhampered use. Easily read d rugged, simple to maintain. B letin No. DN-7.

MINE SAFETY APPLIANCES COMPANY

201 N. BRADDOCK AVENUE • PITTSBURGH 8, PA.

At Your Service: 76 BRANCH OFFICES IN THE UNITED STATES

MINE SAFETY APPLIANCES CO. OF CANADA, LIMITED

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Representatives in Principal Cities in Mexico, Central and South America—Cable Address: "Minsaf" Pitts

Safety Equipment - Booth No. 70

AT THE INTERNATIONAL AND DOMINION FIRE CHIEFS CONVENTION

2 M.S.A. CHEMOX®

Firemen equipped with the Chemox can enter and work in unbreathable or oxygen-deficient atmospheres with complete respiratory safety, because Chemox makes its own pure oxygen as the wearer breathes, from a replaceable chemical canister. Non-fogging lenses—no high pressure cylinder lines, or fittings. U. S. Bureau of Mines approved for 45 minutes minimum service per canister. Bulletin No. B-14.

3 M.S.A. STREAMLINED FIREMAN'S HELMET

Made of one-piece high pressure molded laminated bakelite, this popular helmet offers maximum protection against bumps and blows. It is light and comfortable to wear; withstands heat, water and chemicals; provides high dielectric strength against electrical hazards. Soft leather sweatband, adjustable crown hammock, self-ventilating. Bulletin No. DX-9.

8 M. S. A. FIRST AID KIT

Designed to meet all the requirements of fire department service, contents of the M.S.A. Kit are protected against dust, dirt, and moisture. Features a complete supply of emergency treatment for immediate application. Unit packages permit quick location, and economical replacement. Bulletin No. FA-100.

9

M. S. A. FOILLE SPRAY KIT

This kit is supplied with an efficient spray gun for quick application to burned areas, promptly easing pain and aiding in the control of shock. An ample supply of Foille in jars which connect to the spray gun and a complete assortment of first aid dressings and accessories are assembled in a weather-proof steel case. Bulletin No. FA-1-A.

10 M. S. A. FLOOD LAMP

Safe in gaseous atmospheres, this lamp combines brilliant, unfailing illumination with easy portability. Equipped with standard Edison Batteries in magnetically-locked steel container. Lamp housing is water and dust proof. Bulletin No. M-10.

Call the M. S. A. Man

on your every safety problem

... his job is to help you.

MSA

SAFETY EQUIPMENT HEADQUARTERS

New fire hose made with DACRON*

POLYESTER FIBER

is lighter, more flexible for easier handling... yet has strength to spare

Now—fire hose that's at least 15% lighter, yet stronger than ordinary hose of the same diameter, is made with "Dacron" polyester fiber. More than two years of field testing has proved that this new hose gets into action faster . . . handles more easily during a fire . . . racks naturally to save loading time.

"Dacron" is used as the load-carrying "filler" cord that reinforces the hose. The exceptional strength of this man-made fiber, plus its lightness and flexibility, result in a hose that offers strength without bulk . . . that's light to carry . . . easy to coil and uncoil.

Fire hose made with "Dacron" will soon be available in volume. Plan now to take advantage of the performance extras offered by this new hose. Before you place your next order, be sure to ask your supplier about hose made with "Dacron".

E. I. du Pont de Nemours & Co. (Inc.), Textile Fibers Department, Wilmington 98, Delaware. *REG. U.S. PAT. OFF.

DACRON Polyester fiber

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

Get these 7 ALL-NEW FEATURES with RCA UHF 2-Way Radio

1. Low-cost tubes.
2. Improved coverage in city areas. Less noise, less absorption of signal.
3. High-efficiency power supply.
4. Optional operation on as many as four frequencies.
5. Built-in metering sockets to speed service.
6. 6-inch antenna to simplify insfallation.
7. "Split" drawer design for easy maintenance.

NEW RCA UHF 2-WAY RADIO

opens up traffic-free channels

PERMITS "UNCROWDED OPERATION"

IF YOU'VE been putting off 2-way radio . . . if you're now operating on an overloaded frequency . . . here's RCA 2-way radio equipment which utilizes many new uncongested channels in the Ultra High Frequency Band, 450-470 megacycles.

NOISE-FREE RECEPTION

With RCA 2-way radio, you eliminate most man-made and natural electrical noise, cut out ignition interference and assure top performance in severe noise areas.

PROVED IN ACTUAL FIELD USE

The UHF equipment, engineered to highest RCA standards, has proved its merit in actual field use in five important systems. The new RCA UHF equipment is ready now to help you solve your problem of channel overloading.

For NEW FREEDOM in radio operations check RCA Ultra High Frequency 2-way radio. MAIL COUPON NOW.

Radio Corporation of America
Communications Equipment Dept. 50U
Building 15-1, Camden, N. J.
In Canada: RCA Victor Company Limited, Montreal

Please send me information of RCA Ultra High Frequency (450-470 mc) 2-way radio.

NAME_____ TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE_____

STATE_____

RADIO CORPORATION of AMERICA
COMMUNICATIONS EQUIPMENT CAMDEN, N. J.

"We carried a life net 30 years and

YOU NEVER KNOW WHEN YOU'LL NEED A LIFE NET

ATLAS LIFE NETS

THE superiority of ATLAS Life Nets has resulted in their use by fire departments the world over. Practically every day, somewhere, an ATLAS Life Net is proving its worth by saving a life otherwise lost to fire. No fire department should ever be without the best life net. Sure—you can carry one for years—and then—your forethought will pay off. ATLAS Life Nets—half or quarter fold—are the world's finest. DON'T BE WITHOUT ONE! Include an ATLAS LIFE NET when purchasing apparatus.

ATLAS TRAINING NETS . . .

Drill tower training can be faster, completely safe, with an ATLAS Training Net. They create confidence—prevent injury—and are so constructed that they can be set up quickly and easily. A single lacing around the outer edge tightens or loosens almost instantly. Encased shock absorbers provide proper resiliency—yet—you can walk on it! Rope intersections are non-slip—providing proportional strain on net. ATLAS is the one net properly engineered for the job—has prevented injury to thousands of trainees—used by leading fire departments everywhere.

POMPIER BELTS

WITH standard or hand brake forged steel hooks (not brass or cast iron), meet all safety requirements. Ask for ATLAS belts with forged steel hooks.

WELL balanced.—Axe and handle one piece forged steel. Insulated moulded rubber handle permits cutting live wires. Note unique cutting edge which has been heat treated and hardened, making it suitable for cutting and ripping light metal. Standard equipment on aircraft. Comes with leather sheath for attaching to body belt.

...and then-it was worth its weight in gold"

Stockton-Record

DRAMATIC RESCUE OF THREE BOYS FROM BURNING WATER TOWER PROVES VALUE OF LIFE NETS!

READ THIS FROM THE STOCKTON, CAL., RECORD

Also of fundamental importance is the fact that the firemen arrived in time and with the kind of equipment needed.

"For more than 30 years, likely ever since the department was organized on a full-time basis, trucks have been going to fires with nets. In all that time it never once was necessary to use a net—until Saturday. The emergency in that instance was so great that there was little chance any other kind of rescue would have worked. Those firemen who manned the net knew what they were doing; they had both held and jumped in training.

"Another several decades may pass before a net is used again to save human life. Yet no one now living will disparage the usefulness of the device or regard its presence aboard trucks with all the other paraphernalia of rescue and fire-fighting as unnecessary. Firemen know what they need to do their job."

READ THIS FROM EDITORIAL PAGE OF FIRE ENGINEERING

No fire department can foretell the kind or time or place of an emergency it may be called upon to cope with, there is no valid excuse for its not being prepared with all possible equipment, and a thorough knowledge of its use, that conceivably may be required in the emergencies to which that fire force is called to face.

We have no doubt that down through those 30 years above mentioned these questions were asked about the Stockton Department's life nets: Are they necessary? Why keep 'em on the apparatus? Why maintain and train men in their operation—*when they're not used?*

The good citizens of Stockton, who watched in awe as flames crept up on those three youths, and the youths themselves know the answer! They know and bless the fire department that was called, and not found wanting.

Perhaps we're wrong, but this seems to us to be the sort of conclusive evidence that every civic minded official should have before him, when it comes to outfitting his local fire forces.

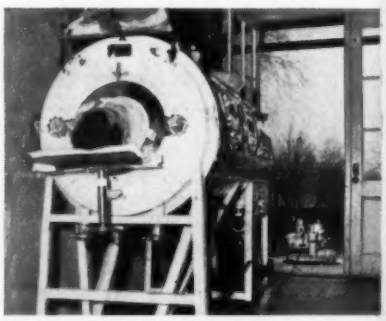
GO PREPARED—CARRY A LIFE NET—LEARN TO USE IT—AND—Specify the ATLAS when you buy!

ATLAS SAFETY EQUIPMENT CORP.

27 WARREN STREET, NEW YORK 7, NEW YORK

All from ONE HOMELITE Carryable GENERATOR

Homelite Generators give you brilliant, flicklerless floodlighting for night fires or accidents.



Homelite Generators give you emergency power for iron lungs, hospitals, buildings or communication systems.

There's always a need for a Homelite Carryable Generator. Tonight, you might need it for floodlighting a fire, or a bad accident, or a drowning. Tomorrow, it could operate electric saws and other tools at a fire or accident. Or you might get an emergency call for your Homelite to keep an iron lung going for some young polio victim. Yes, and if disaster strikes . . . a hurricane, tornado, flood or blizzard . . . the call goes out for miles around to *rush the Homelites in.*

Homelite Gasoline Engine Driven Generators . . . light enough for one man to pick up and carry . . . are, more than ever, a must for fire departments. You need them for fires. You need them for accidents, emergencies, disasters. You need them for civilian defense.

Write today for our new bulletin showing many important uses of all Homelite Carryable Equipment . . . Generators, floodlights, pumps and chain saws. It's free.

Homelite Generators give you power for operating chain saws and other electric tools.

Manufacturers of Homelite Carryable Pumps • Generators Blowers • Chain Saws

PERFORMANCE · DEPENDABILITY · SERVICE

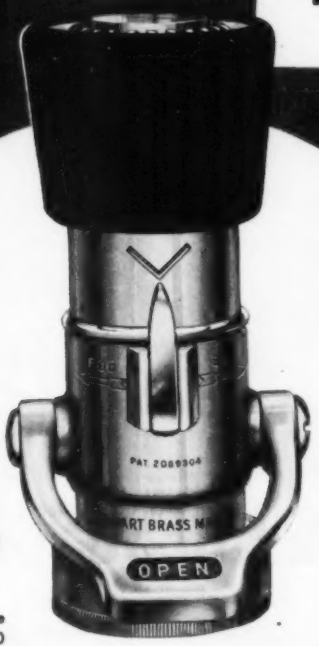
HOMELITE CORPORATION

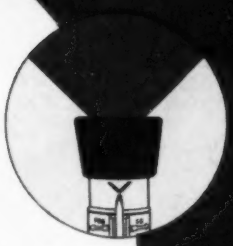
309 RIVERDALE AVENUE • PORT CHESTER, N. Y.

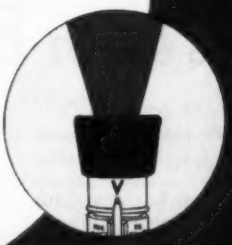
Canadian Distributors: Terry Machinery Co., Ltd., Toronto, Montreal, Vancouver, Quebec

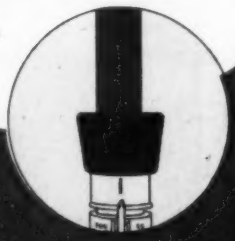
Select-O-Stream

Mystery Nozzle









NEW 1" SIZE

as easy to adjust at high pressure as at low...

actual tests at nozzle ures exceeding 500 new 1" size dem- the same ease adjustment as ures of 100 main-

You get the stream you want—at a finger's touch. And you get it fast. No need to see it . . . the embossed (Braille-like) Stream indicators "tell" your fingers by touch. The SELECT-O-STREAM MYSTERY NOZZLE locks to the stream you choose. Shuts off in any position. Set to turn on in any position. Protective curtain of water at the wide "V" . . . 30° fog at the standard "V" . . . Straight Stream at the "I"—and any degree of stream in between. Be sure to write for literature now!

SIZES NOW AVAILABLE—1"—1½"—2½"

ELKHART BRASS MFG. CO., Inc.

OVER FIFTY YEARS OF FIRE FIGHTING PROGRESS

ELKHART, INDIANA

WITH THESE EXCITING FEATURES

SET TO ANY STREAM WITHOUT LOOKING
Embossed stream indicators automatically "tell" your fingers—selects the stream

☆

SHUTS OFF IN ANY POSITION

☆

SET TO TURN ON IN ANY POSITION

☆

LOCKS TO THE STREAM YOU CHOOSE

☆

SEPARATE BALL TYPE SHUT OFF
(Brass to neoprene seat)

☆

IMPROVED GRIP—
serves as both grip and bumper. Mechanically sealed—it won't come off

Save More Lives With E & J RESUSCITATORS

- In asphyxiation cases the victim needs oxygen FAST; *the E & J breathes pure oxygen for the patient automatically, safely and effectively as long as necessary.*
- The victim may be severely injured or hard to reach for manual resuscitation; *the E & J touches only the face and can even resuscitate through a catheter if necessary.*
- The victim's throat may be blocked by unseen obstruction or faulty head position; *the E & J signals instantly if oxygen can't enter the lungs and it provides an aspirator to remove normal obstructions. When a partial obstruction cannot be dislodged, the E & J can be adjusted to usually by-pass it and get oxygen to the lungs at a slow but life-saving rate.*
- The victim's heart action may be weak; *the alternating positive and negative pressures as used by the E & J have been shown to benefit heart action.*

These are just a few of the reasons why Rescue Squads call the E & J their "greatest life-saving tool." Check these and many others at a free, full-scale demonstration right in your own Department. Just write or wire today to:

E & J RESUSCITATOR • INHALATOR • ASPIRATOR

Triple Model Illustrated

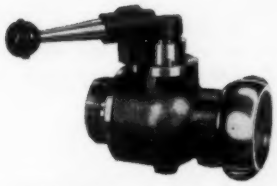
E & J MANUFACTURING COMPANY

Dept. 526-6, Burbank, California

Products for the Entire FIRE FIGHTING FIELD

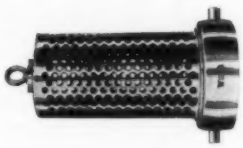
TRUMPET SIAMESE VALVES

Famous "Control-Flo" valve action, roller bearing swivel construction. Designed as short as possible (9") for apparatus body clearance. Available in 4", 4½", 5", or 6" diameter sizes.



CONTROL-FLO APPARATUS VALVE

Operates easily at any pressure, in either direction. Controls hose pressures without changing pump speed. Throttle type handle locks "Control-Flo" valve in any position.

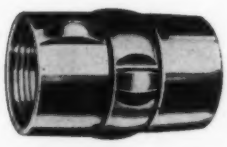


TRUMPET TUBE STRAINER

A suction strainer made of heavy cast brass throughout. The ample hole arrangements permits free suction to pump for maximum performance. Made to individual thread requirements in all sizes from 1½" through 6".

FIRE TRUCK FITTINGS

Wooster Brass can furnish highest quality truck fittings such as brackets, pole and bar holders, seat handles, hose clamp handles, axe holders, etc. Polished brass or chrome finishes available.



SKI-LUG FIRE HOSE COUPLINGS

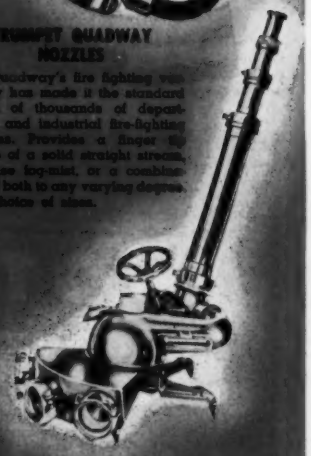
Scientifically shaped to eliminate hooking when drawing hose lines over obstructions. Pin-lug couplings also available for fire hose, mill hose and linen hose. Full rounded lug contour reduces pulling friction.

TRUMPET SUCTION HOSE COUPLINGS

Available in 3 combination handle-lug types. The high quality workmanship and finish of Wooster Suction Hose Couplings will make you proud to put them on any equipment. Made with a free-action, roller bearing swiveling feature.

TRUMPET QUADWAY NOZZLES

The Quadway's fire fighting versatility has made it the standard nozzle of thousands of departments and industrial fire-fighting systems. Provides a finger tip choice of a solid straight stream, a dense fog-mist, or a combination of both to any varying degree. Full choice of sizes.



GEYSER TURRET NOZZLES

Available in 2, 3, or 4-inlet types. Can be turned in a complete circle horizontally. Full adjustable vertical range. Operates safely at lower elevation ranges.

GEYSER DECK PIPES

Mount on apparatus or wherever permanent fire protection is needed, such as lumber yards and oil fields. Has full 360° horizontal sweep and a vertical range of 10° below and 80° above horizontal.

The precision products shown here are just a few of the many items of cast brass fire equipment manufactured by Wooster Brass. Write for your catalog now . . . and consult your Wooster Brass representative for all your equipment requirements.

WOOSTER BRASS

WOOSTER, OHIO

A DIVISION OF THE FYR-FYTER COMPANY

FireChiefs

Globe Suits are comfortable, warm, and dry . . . ready for action in any weather. Quick-hitch Globe Suits have been endorsed by Fire Chiefs everywhere.

See them at your dealer's or write for our descriptive folder.

23D—Detachable
With "SCOTCHLITE"

28D—Detachable

GLOBE SUITS ARE REALLY THREE GARMENTS

. . . each designed to do a specific job. One, the outside garment, is tough duck, made to take the rough usage fire fighting demands. It protects garment number two, the waterproof interlining. Garment three is the lining, light for warm climates, heavy for cold sections. The GLOBE SUIT combines these three garments into ONE PERFECTLY BALANCED SUIT!

27R—Light Weight

GLOBE SUITS ARE ABSOLUTELY GUARANTEED!

They insure a long, serviceable life, and maximum protection when you need it most.

GLOBE SUITS are constantly being improved. When new materials offer better wear, longer service and greater safety—GLOBE will lead in using them.

We gratefully acknowledge your ideas and suggestions; with your help we have made GLOBE SUITS
STANDARD FOR THE BEST
—for over 50 years!

29R—Light Weight

"The Suit that Suits!"

GLOBE

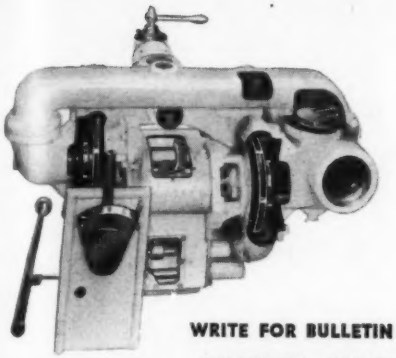
DURABLE FIREMEN'S

SUITS

Since 1901

GLOBE MANUFACTURING CO.
PITTSFIELD, NEW HAMPSHIRE

24R—Wool Lining

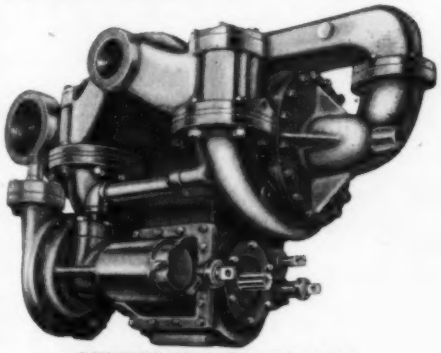


WRITE FOR BULLETIN NO. 8733

DMA MIDSHIP MOUNTED TWO-STAGE

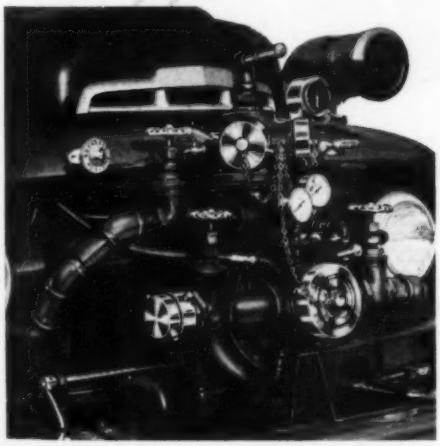
see the ENGINEERING QUALITY

of these 3 BARTON-AMERICAN FIRE PUMPS . . .



REQUEST BULLETIN NO. 8734

DMB MIDSHIP MOUNTED FOUR-STAGE



SEND FOR BULLETIN NO. 8330-B

UA FRONT MOUNTED

At the I.A.F.C. Convention, be sure to get the inside story of AMERICAN-MARSH engineering quality. See for yourself how simplicity of design, precise construction, and brilliant engineering give you vital advantages with any of these BARTON-AMERICAN Fire Pumps.

Demonstration pumps will be displayed at the I.A.F.C. Convention in Toronto, September 15 through 18.

Write now for Bulletin describing the pump that interests you most!

COME TO AMERICAN-MARSH BOOTH NO. 55 AND 56

BATTLE CREEK — AMERICAN-MARSH PUMPS — MICHIGAN

In Canada: American-Marsh Pumps (Canada) Ltd., Stratford, Ont.

Bump that assures positive results

When fire strikes, seconds count . . . your fire extinguishers must be the right type and function properly from the very start . . . failure means serious losses.

The growing popularity of the highly effective powdered dry chemical fire extinguishing agent may be hampered by a drawback . . . settling or packing can occur after a lapse of time. However, with C-O-TWO Dry Chemical Type Fire Extinguishers there's no chance of this happening.

The exclusive inverting and bumping design of C-O-TWO Dry Chemical Type Fire Extinguishers provides mechanical breakage of the dry chemical by shifting its position in the cylinder. This outstanding mechanical breakage, plus continuous inert gas pressured agitation or fluffing of the skillfully blended free flowing dry chemical, guarantee lasting, foolproof fire protection.

No other brand on the market today gives you this extra margin for positive results. Inverting and bumping is only one of many unique design advantages that make C-O-TWO Dry Chemical Type Fire Extinguishers your best buy for killing flammable liquid and electrical fires, as well as surface fires involving ordinary combustible materials.

With C-O-TWO Dry Chemical Type Fire Extinguishers the heat-shielding dry chemical is a non-conducting, non-abrasive, non-toxic, finely pulverized powder compound . . . blankets fire instantly. Sizes range all the way from 4 to 150 pounds capacity . . . all fully approved by the Underwriters' Laboratories, Inc., Factory Mutual Laboratories and Government Bureaus.

Act now for complete free information on these top quality, sure-acting fire extinguishers. Remember fire doesn't wait . . . get the facts today!

C-O-TWO

MANUFACTURERS OF APPROVED FIRE PROTECTION EQUIPMENT

Squeez-Grip Carbon Dioxide Type Fire Extinguishers
Dry Chemical Type Fire Extinguishers
Built-In High Pressure and Low Pressure Carbon Dioxide Type Fire Extinguishing Systems
Built-In Smoke and Heat Fire Detecting Systems

C-O-TWO FIRE EQUIPMENT COMPANY
NEWARK 1 • NEW JERSEY

C-O-TWO FIRE EQUIPMENT OF CANADA, LTD. • TORONTO 8 • ONTARIO

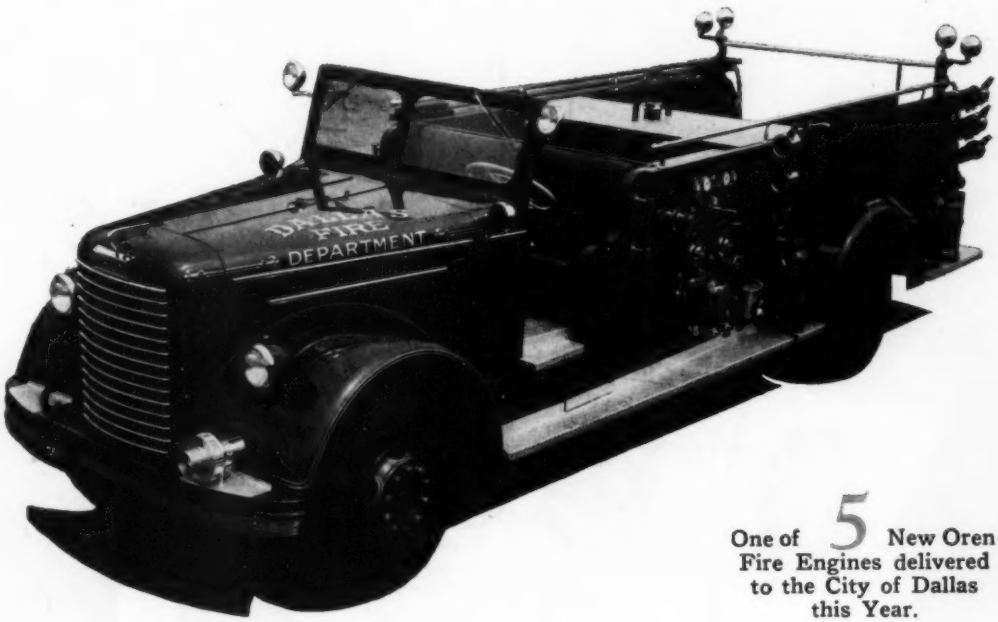
Sales and Service in the Principal Cities of United States and Canada

AFFILIATED WITH PYRENE MANUFACTURING COMPANY

DALLAS, TEXAS

DEMANDS THE VERY BEST AND

GETS IT!



One of 5 New Oren Fire Engines delivered to the City of Dallas this Year.

DALLAS is but one of the many progressive American Cities to join the growing List of Oren Users recently. Multiple orders received also from NASHVILLE, TENNESSEE; BURLINGTON, VERMONT; PENNSAUKEN, NEW JERSEY; ELKTON, MARYLAND; SPRINGFIELD, OHIO, and many Others.

OREN Fire Apparatus is available in a wide range of Custom-Built models, and can also be furnished built on your choice of Commercial chassis. Your request for information will receive prompt response.

OREN

ROANOKE 16, VIRGINIA

our New Catalog is yours

It contains a wonderful collection of the finest badges we have made in our 75 years. It's yours for the asking — every fire company — every equipment dealer should have it. Please write on your company stationery —

BRAXMAR

OUR DIAMOND JUBILEE CATALOG

BADGES

THE C. G. BRAXMAR CO., INC. • 216 East 45th Street New York 17, N. Y.

John O. Veit, President
John O. Veit, Jr., Sec. & Treas.

The C. G. BRAXMAR CO., INC.
216 East 45th St. New York 17, N. Y.

JOHN BEAN

adds a new dimension to firefighting

the new combined
true high-pressure fog
and volume fire-fighter

Fast-striking high-pressure fog backed up by slugging volume power now makes it possible for you to fight fires as never before. Bean engineers add this greater dimension to firefighting techniques with their new combination high-pressure fog and volume fire-fighter. It boasts the biggest firefighting wallop ever packed into one unit. Two famous Bean pumps (operating simultaneously or separately) offer you the chance to attack the fire with 2 high-pressure and 4 volume lines. A 500-gallon tank allows you to start pumping seconds after you arrive at the scene. You can get in fast and keep slugging for a "quick kill."

Besides this new approach to firefighting methods, Bean engineers have fashioned a streamlined, sleek-looking truck with a low center of gravity for safe riding at high speeds. 5 full-size compartments furnish more than 45 cubic feet of storage space for supplementary equipment. A rear fill hopper with an easily removable strainer makes filling a simple operation. For fighting grass, prairie, or other running fires, both high-pressure lines can be used while the truck is in motion.

OUR BEST SALES TALKS COME FROM THE CHIEFS WHO USE BEAN FIRE-FIGHTERS

Write these men for their opinion of the unit.

Fire Chief Eugene Davidson—Bedford, Penn.

Fire Chief R. L. Henry—Annandale, Virginia

JOHN fmc BEAN

TWO-FISTED FIRE-FIGHTERS

Can be mounted on most standard truck chassis

John Bean Division
Dept. 126
Lansing 4, Michigan

John Bean Division
P.O. Box 145
San Jose, California

A PRODUCT OF FOOD MACHINERY AND CHEMICAL CORPORATION

*Pocketaire** IS TAILOR-MADE FOR SAFETY SUITS!

MODEL 1510-S Fits Standard Fire Suit Without Alteration

WEIGHT—4¾ lbs. **LIFE—15 MINUTES**

There's little oxygen in the middle of those fires and atmospheres where temperatures range up to 1800 degrees F. Equip your safety suits with POCKETAIRE—and BE SAFE!

FOR DATA ON SAFETY SUIT, See Page 703.

* Patents Pending

FOR COMPLETE STORY, SEE YOUR DEALER OR WRITE DIRECT TO

Cycle-Flo Co.

MILFORD, CONNECTICUT

*Pocketaire** **MODEL 1500**

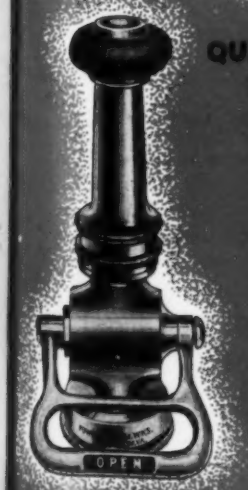
WEIGHT 4 LBS. • LIFE 10 MIN.
(Weight 8½ Lbs. with 30-Min. Cylinder)

BREATHING EQUIPMENT ON THE MAN INSTEAD OF ON THE TRUCK!

ALWAYS
SPECIFY
BY NAME
"SENSIBLE LUG"

"SENSIBLE"

QUARTER TURN
SHUT-OFF
SIAMESE



SACHEM
NOZZLE

Why compromise when you can buy—

SENSIBLE LUG

Top fire departments all over the United States, leading manufacturers of fire hose, the U. S. Army, Navy and big industrials, have selected "Sensible Lug" couplings as one of the finest they can buy. Why compromise with couplings of less dependable quality and workmanship than can be yours in "Sensible Lug" couplings!

The "SENSIBLE" is always BEST

The BEST is always "SENSIBLE"

Catalog on request

Our 61st year

POWHATAN BRASS
and **IRON WORKS**
RANSON, WEST VIRGINIA
Phones 93 & 94 Charles Town West Virginia
Established 1892

What every fireman should know about high pressure fog fire equipment

Using small lines, faster attack and more efficient application of water, fire fighters have found that in many cases high pressure equipment offers certain advantages over low pressure equipment. For example, it has been found that high pressure fog can be used on more fires than low pressure fog since it reaches 60 to 70 feet. And because high pressure fog is usable on all types of fires, it provides an all-around fighting tool.

For Blasting, Smothering, Cooling

High pressure fog is effective in extinguishing fires by blasting, smothering, and cooling. In many cases it combines all three methods of fire extinguishing. By blasting fog particles against a flame, the fire can often be swept off the fuel. Using the smothering technique, high pressure fog particles literally hang in the air in an enclosed space, and the fire cannot get enough oxygen. For cooling, the small fog particles absorb heat faster because more water surface is exposed to heat. These advantages also mean that less water is needed to extinguish a fire.

Attack Is Faster

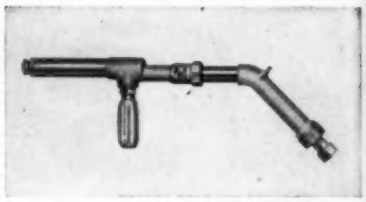
Hose lines are ready to use at all times and no time is lost laying them to the fire. The pump will provide full pressure at the nozzle with the operation of only one valve. In fact, it is possible to have the pump operating before the truck has come to a stop.

Less Manpower

Hose lines are ¾" inside diameter and light and flexible. Thus they can be handled easily and efficiently by a minimum number of firemen. No special skill is required to use high pressure fog equipment, although of course, fog can be applied more efficiently by trained firemen.

Protects Personnel

The high pressure fog stream drives heat ahead of the fireman as he advances on a fire. At the same time it absorbs the radiated heat. This makes it possible to fight many fires at close quarters where most good can be done. In addition, a fine fog stream can be directed against electrical equipment without danger to firemen.



MYERS SILVER FOG FIRE GUN. Newest design. No recoil, single control, chrome finish. 3½ to 27 GPM. From 400 to 800 lbs. pressure.

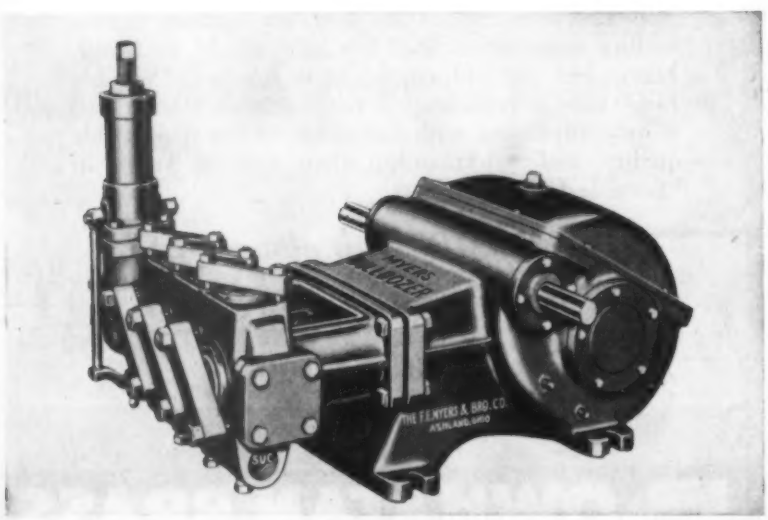
MYERS LONG DISTANCE GUN. Carries a straight stream greatest possible distance before it breaks up. Length 49 inches. Range of 19.6 to 43.5 GPM. Pressures of 400 to 800 lbs.

Less Water Damage

Since the small water particles of high pressure fog absorb heat very rapidly, most of the water applied turns to steam. There is far less run off to cause damage and thus property loss is reduced.

High pressure fog permits the most efficient use of small lines in attacking and controlling fire. It greatly increases the percentage of fires which can be handled by booster lines and tanks. Each time a fire of this class is extinguished promptly a major fire is prevented.

For complete information on Myers high pressure fog equipment write for catalog M-624.



MYERS BULLDOZER FIRE PUMPS. Because Myers high pressure pumps are compact and easy to mount, they can be located in any of various places on the truck chassis. Capacities of 60, 40, 20 and 15 gallons per minute. 800 lbs. pressure. Self-oiling.

THE F. E. MYERS & BRO. CO.
317 Fourth St., Ashland, Ohio

From Coast to Coast - FIRE EXPERTS ENDORSE INDIAN FIRE PUMPS!

"Should be standard equipment"

From Lakefield, Ontario, Canada comes this statement: "**INDIAN FIRE PUMPS** should be standard equipment on every piece of fire apparatus."

Allan H. Clark
Chief of Fire Dept.
Sec. Treas. Dominion Assn. of Fire Chiefs

"Indispensable"

And from Massillon, Ohio: "We have used **INDIAN FIRE PUMPS** for years. They are indispensable when the fire is beyond the reach of a Booster line besides being ideal for many other uses."

Ray H. Earle **Fire Chief**
Massillon, Ohio Fire Department

"For this type of equipment we prefer the INDIAN FIRE PUMP"

Spence D. Turner
County Forester
& Fire Warden, Los Angeles County
Los Angeles, Calif.

"No department complete without them"

This from New Hampshire: "I have been connected with Fire Department operations since 1922 and have seen hours gained in fire suppression with **INDIAN FIRE PUMPS.** I recommend them very highly. No equipment is complete without them."

Aubrey G. Robinson
N. H. State Fire Marshal
State House, Concord, New Hampshire

SEND FOR CATALOG

Smith INDIAN Drinking Water & Sanity Tank

Smith INDIAN Backfiring Drip Torch

Widely used for slash disposal, burning right of way, etc. 1 gal. tank. Brass feed pipe. Strong construction. Designed for fire dept. backfiring work.

Have you ordered INDIAN FIRE PUMPS for Civil Defense? Be Prepared!

D. B. SMITH & CO.

406 MAIN ST
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PACIFIC COAST BRANCHES

Hercules Equipment & Rubber Company, Inc.
435 Brannan Street
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Fred E. Barnett Company
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Fred E. Barnett Company
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Mill & Mine Supply Co.
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426 West Third Street South
Salt Lake City, Utah

CANADIAN AGENTS:

Fleck Bros. Limited
110 Alexander Street
Vancouver, B. C., Canada

C. E. Hickey & Sons, Ltd.
Hamilton, Canada

STAMINA!

They asked the impossible from this Sea-Horse—*and got it!* It drove through shallow waters, fouled with obstructions. It battled treacherous currents, squeezed in and out of close quarters, yet lost no time, and tore for "home" in the open stretches.

It took a drenching, a beating—was overworked, overloaded—and kept right on going, *dependably*.

Only moments were needed, if necessary, to transfer it to another hull—a barge, raft, pleasure-type craft, or any available large outboard boat.

Johnson Sea-Horses will serve *you* well, and economically, in many, many ways. Check with your Johnson Dealer. Look for his name under "Outboard Motors" in your classified phone book.

All horsepower is OBC Certified brake hp at 4000 rpm.

Sand bags and food are delivered to workmen fighting to protect a levee from the ravages of a swollen river—Omaha area of Missouri River flood of 1952. Boat is powered by a 25 hp Johnson Sea-Horse.

Johnson
SEA-HORSES
FOR DEPENDABILITY

FREE! Write for free catalog which describes in detail the 4 great Sea-Horses—from 3 hp to 25 hp. A size for every outboard need.

JOHNSON MOTORS
7000 PERSHING ROAD, WAUKEGAN, ILLINOIS
In Canada: Manufactured by Johnson Motors, Peterborough

Announcing...

The FOG-KAR by THIELE

High Quality! Low Cost! FOG-KAR

Never before has the fire fighting industry been offered a value such as this!! We feel we have answered the need for small, economical and efficient fire fighting equipment.

Model shown is equipped with a 500 gallon booster tank and this converted into fog is equivalent to 5,000 gallons of water. It can be filled by hydrant bucket or draft. All Thiele "Fog-Kars" are equipped with the reliable F. E. Myers high pressure pump.

Thiele's "Fog-Kars" enable you to DRIVE up to the scene of the fire! Built for endurance as well as performance the "Fog-Kars" move swiftly across the toughest terrain. And because of its functional design, curved streets and narrow alley ways are no longer a problem—the "Fog-Kar" weaves its way through conjested areas quickly and easily. Its compact engineering panel control makes the "Fog-Kar" a "One Man" operation.

ONE MAN CONTROL!

Instrument panel is in weather-proof compartment on driver side. To facilitate a "One Man" operation all controls such as guage, starter button (chasis permitting), vacuum clutch, gas throttle, power take-off and all pump controls have been compactly arranged in a readily accessible area.

This means that one man, upon reaching the scene of the fire, can have the Thiele "Fog-Kar" into operation within seconds. No wasted motion with all the controls at your fingertips.

Yes, test after test has proven the new Thiele "Fog-Kar" to be truly outstanding in every feature.

Check the performance, construction and equipment and you will find that nothing on the market can compete with the "Fog-Kar" in this price range.

For as little as $7,000 complete! Ideal for city, country, farm, factories, estates, resorts, and schools.

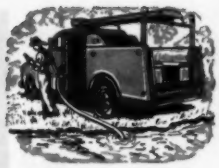
SPECIFICATIONS:

FOG-KAR . . . Complete Packaged Unit
For as Low as $7,000 (F.O.B., JOHNSTOWN, PA.)

- Any standard 1½ ton dual wheel truck chassis CA 84 in. maximum
- 500 Gal. Tank
- 60 Gal. per minute Myers Pump at 800 lb. pressure
- 2 Hose Reels (150'-1" booster hose each reel)
- 2 Myer's High Pressure Fog Guns
- Fire Axe
- 2 Extinguishers (Soda Acid and CO_2)
- 24' extension Ladder and 12' Roof Ladder—(Wood)
- 2—10' Suction Hose Sections 2½" mounted in space saving roof rack
- Flasher light and Siren
- 2 Spot Lights
- 2 Hose Lights
- Customed Painted & Lettered

Additional Equipment Available

Prices and Specifications subject to change without notice.



PROMPT DELIVERY

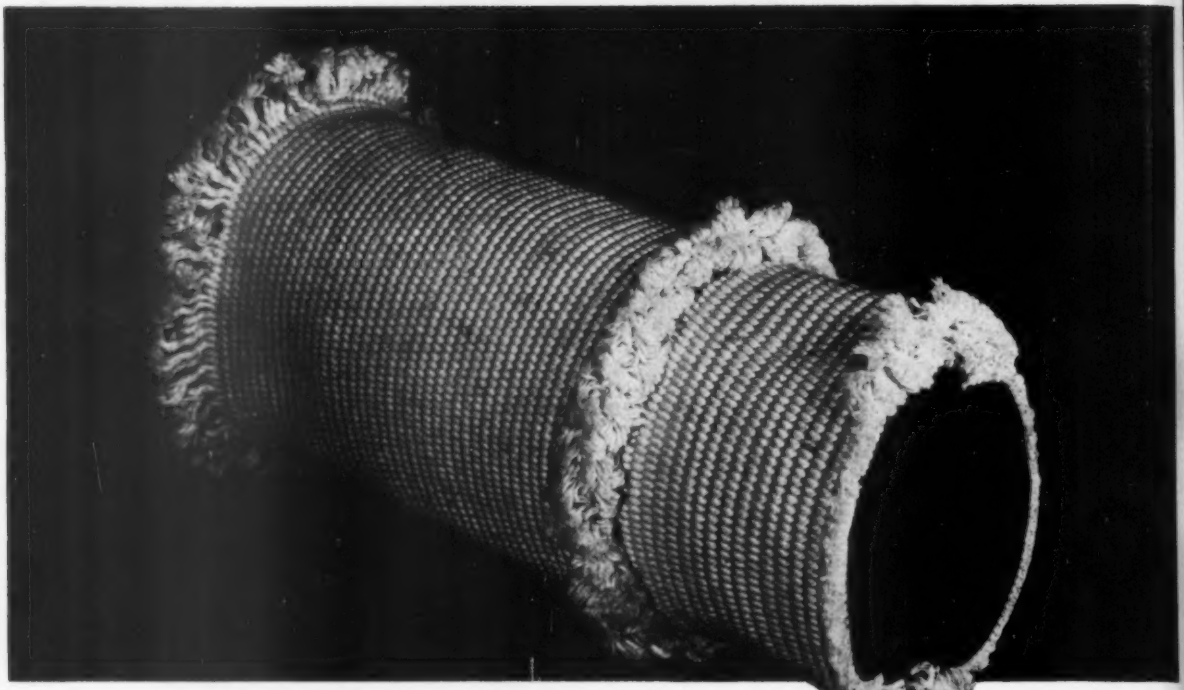
Don't wait—write today for additional information about the Thiele "Fog-Kar", and other specialized fire equipment.

Customizing since 1901.

Franchises Available

W. J. THIELE & SONS, INC. Pine at Cherry JOHNSTOWN, PA.

Designers, Manufacturers and Distributors of Truck Bodies and Equipment



FLEXIBLE

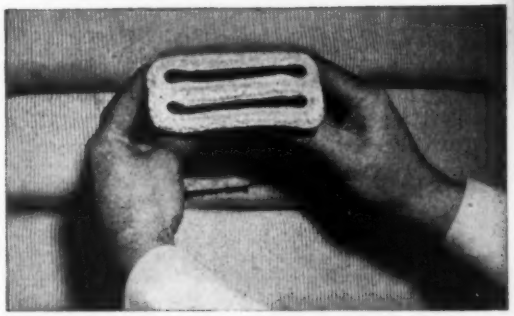
HEWITT-ROBINS

Bi-Roll Municipal Fire Hose

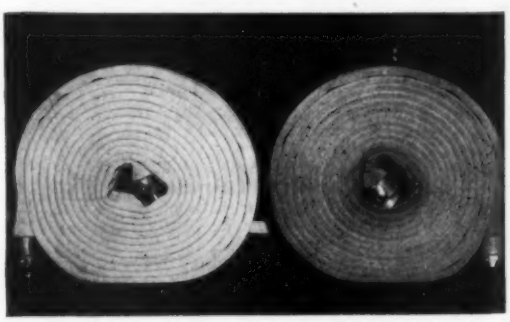
Here's the hose that gives you the flexibility and safety you need for fighting fires . . . Hewitt-Robins Bi-Roll municipal fire hose.

Bi-Roll's greater flexibility means that 30% to 40% more hose footage can be stored or dispensed in a shorter time with greater handling ease and safety.

For complete information about Hewitt-Robins Municipal Hoses . . . Bi-Roll—Chemical Booster—Fog—Suction—Street and Sewer Flushing, contact Municipal Fire Hose Division, P. O. Box 974, Buffalo 5, N. Y.



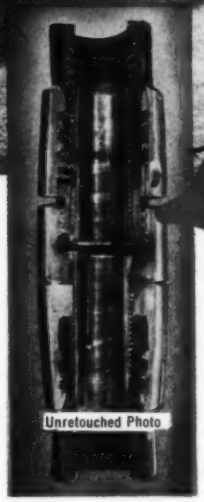
Bi-Roll . . . provides greater over-all flexibility because of its non-vulcanized point-of-fold construction . . . permits a flatter fold under light pressure . . .



Bi-Roll is available either with or without wax and gum treatment. Treated Bi-Roll provides 100% proof against mildew and rot . . . is equally pliable in hot or cold weather.

HEWITT-ROBINS EXECUTIVE OFFICES **INCORPORATED** STAMFORD, CONNECTICUT

DIVISIONS: Hewitt Rubber • Robins Conveyors • Robins Engineers • Resifoam®



BAR-WAY COUPLINGS...

For booster and high pressure fog lines

There are four good reasons why the fire fighters specify BAR-WAY couplings. Four reasons why BAR-WAY couplings are growing in favor with firemen, hydraulic engineers and others who insist on the best.

- **SAFETY**—The coupling becomes the *strongest part of the hose line.* Tested to 3000 pounds pressure and 500 pounds pull.
- **FULL FLOW**—No suppression of flow in coupling. No shrinkage of hose at coupling.
- **FLEXIBILITY**—Reels smoother. Easily replaced. Nothing to catch on corners or underbrush.
- **BETTER MADE**—Accurately machined, always the same, interchangeable. WILL NOT FAIL.

Send for our free pamphlet. Gives detailed specifications for all types of pressure hose, ID and OD.

BAR-WAY
MFG. CO.
STAMFORD, CONN.

THE LIFE OF YOUR COMMUNITY MAY DEPEND ON . . .

Complete Protection

WITH G-E 24-HOUR DUTY RADIO EQUIPMENT!

EYE-OPENING CIVIL DEFENSE FILM!

Produced by March of Time for General Electric—"And A Voice Shall Be Heard!"—has set a box office audience record of more than 7 million. If you haven't done so already, arrange for a public showing in your community. See G-E communications equipment in action!

THE true value of a civil defense plan can easily be determined in advance of disaster by recruiting sufficient personnel . . . observing the seriousness of their efforts in training . . . and by knowing you have the finest equipment to work with. Examine the communication element of your preparations first. Will the station equipment, in an extreme need, operate for 24 hours of continuous transmission (as required by FCDA) without component failure? If not, then it will pay you to investigate this *built-in reserve performance* feature of a General Electric system.

Discover why G-E communications equipment is preferred when dependable service . . . and maintenance economy are vital factors! Call the CAS* man at a local G-E office today or write: *General Electric Company, Section 5993, Electronics Park, Syracuse, New York.*

**Communications Advisory Service*

You can put your confidence in—

1878 75 1953 YEARS OF ELECTRICAL PROGRESS

GENERAL ELECTRIC

Eastman

SERVING THE FIRE FIELD OVER 100 YEARS

Our Purpose

To provide the fire service with only the highest quality brass goods it is humanly possible to produce at a fair price—to provide the fire service with the means of delivering the most effective fire streams the field has ever known—this is both our purpose and pledge to the service. Over the years our products have attained a high standard of excellence—which will be our purpose to maintain.

Our Proposition

We will gladly ship sample outfits at our expense on 30 days' trial anywhere in the United States, subject to any test desired. If the product does not come up to our claims in every particular, you can notify us and hold shipment subject to an order. If we can accomplish what we claim you certainly should not be without the product —if we cannot it costs you nothing.

Products you can depend on—everytime

Double male connections furnished with ear lugs, as shown, or with pin lugs. Larger sizes furnished with long handles.

Double female connections all furnished with rollers, as illustrated, available in the same forms as double males.

Hydrant or pumping unit Wye, furnished as illustrated, all threads recessed with Higbee form cut.

Caps furnished in all sizes, with or without chain connection.

Angle elbow eliminates crimping of hose at the pump and allows full stream capacity.

Plain Siamese or Wye, can be furnished with one female inlet and two male outlets, or with two female inlets and one male outlet.

Screw stem type gates, for the absolute stoppage of water.

Our unmatched Eastman Deluge Gun, available in two-, three- or four-way models. Can be used as either a portable or permanent gun.

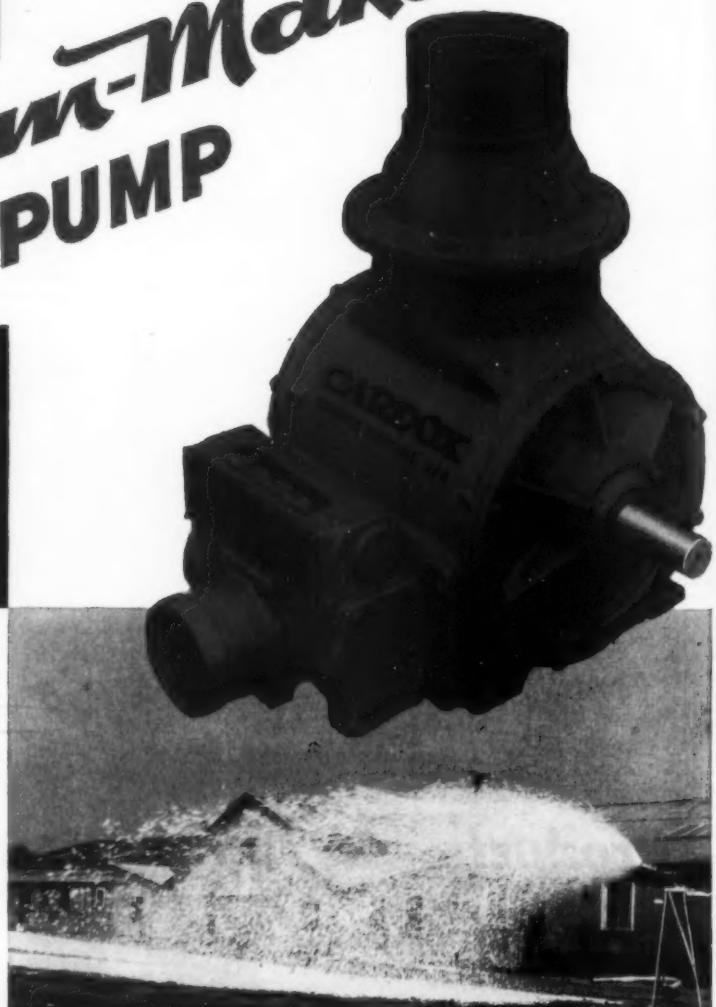
Contact your Eastman Dealer—or write—

SAMUEL EASTMAN CO., INC.

CONCORD, NEW HAMPSHIRE

Announcing the
NEW CARDOX

"Foam-Maker" PUMP



3,000 GPM!
(Nominal at 1200 RPM with CARDOX TURRET NOZZLE)

ANOTHER CARDOX FIRST—
A pump exclusively designed for foam generation. Makes foam in the pump —not in the nozzle!

GIVES YOU THE QUANTITY AND QUALITY ... of foam needed to meet today's ADVANCE THINKING in foam fire protection!

NOT ONLY MORE FOAM, BUT BETTER FOAM! Produces homogeneous, evenly dispersed "sno-foam" for much more effective fire fighting performance, with maximum range in all patterns.

GET THE FULL FACTS
ON THE TRULY REVOLUTIONARY CARDOX "Foam-Maker" SYSTEMS.
WRITE TODAY FOR FURTHER INFORMATION!

The CARDOX "Foam-Maker" Pump in action with its companion equipment, the new CARDOX Turret Nozzle, designed especially for use with the "Foam-Maker" Pump.

- **3000 GPM—12 to 1 expansion.**
- **30 to 40 feet effective range, dispersed (shown) through 140 to 160 feet effective range straight stream.**
- **25 to 30 minute drain-off.**

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CARDOX CORP.

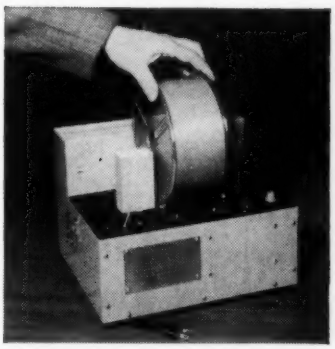
CARDOX CORPORATION

BELL BUILDING • CHICAGO 1, ILLINOIS • *District Offices in Principal Cities*

NOW *24 hour* TAPE RECORDING ...NON-STOP!

Records Every Word—TIMED TO THE MINUTE

Model D-24
Dual Channel



Erase the 24-hour tape in just 20 seconds — simply by rotating the reel in the SoundScriber Tape Demagnetizer!

NEW SoundScriber 24-hour Tape Recorder
INVALUABLE for Recording Fire Alarms

Continuous, uninterrupted, unattended magnetic tape recording for a full 24-hour day—with the time printed on the tape to indicate the exact minute of recording—that's the story of this new SoundScriber 24-Hour Tape Recorder, already proved in hundreds of military installations.

This new SoundScriber development is versatile, trouble-free, requires no attention during operation. It records a single channel, or dual channels simultaneously, from microphones, incoming lines, or a combination of both. Built-in speaker or accessory headphones allow instant "listening-in" while recording or playing back.

The 24-hour reel of tape, only seven inches in diameter, makes a complete, economical, permanent automatically timed record of a full day's communications . . . or is easily erased for repeated re-use. Longer recording periods, almost unlimited in time, can be attained through simple modifications.

SoundScriber's unique mechanical design operates at approximately 1/60 the speed of conventional tape recorders —assures longer life and minimum service attention.

Contained in a sturdy aluminum carrying case, the SoundScriber 24-Hour Recorder operates from standard electrical outlets. The chassis is easily removed for mounting in conventional 19" rack.

The 24-Hour Recorder meets JAN specifications. It is now available for immediate delivery to commercial and other users.

Designed and produced
by the manufacturers of

Sound Scriber
DICTATING EQUIPMENT
TRADEMARK

MAIL COUPON TODAY FOR FURTHER INFORMATION

The SoundScriber Corporation FE-9
New Haven 4, Conn., USA

I want to know more about your 24-Hour Tape Recorder. Please send further data and sample of tape.

Name_____

Address_____ City_____

Kind of Business or Operation_____

the
BI-LATERAL
FIRE
HOSE
COMPANY
welcomes
this
opportunity
to congratulate

THE INTERNATIONAL

ASSOCIATION OF FIRE CHIEFS

for its unceasing efforts in behalf of "the Advancement of the Fire Service." We are pleased to cooperate with the International at all times.

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"EVERY Fire Chief should be a member of IAFC

•

BI-LATERAL FIRE HOSE COMPANY

20 NORTH WACKER DRIVE • CHICAGO 6, ILL.

Sustaining Member of IAFC

ARKANSAS, FORT SMITH
Interstate Fire Equip. Co.
L. W. Graves
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CALIFORNIA, SAN MARINO
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COLORADO, DENVER
Fire Protection, Inc.
1017 Lawrence

CONNECTICUT, OLD GREENWICH
Orville A. Sawyer
P.O. Box 73

FLORIDA, CORAL GABLES
O. C. Wipper
413 Fluvia Avenue

ILLINOIS, BARRINGTON
Great Lakes Fire Equip. Co.
Michael Dalton
726 S. Grove

INDIANA, INDIANAPOLIS
Midwest Fire & Safety Equip. Co.
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Universal Safety & Fire Equip. Co.
727 South West Temple St.

WISCONSIN, MADISON
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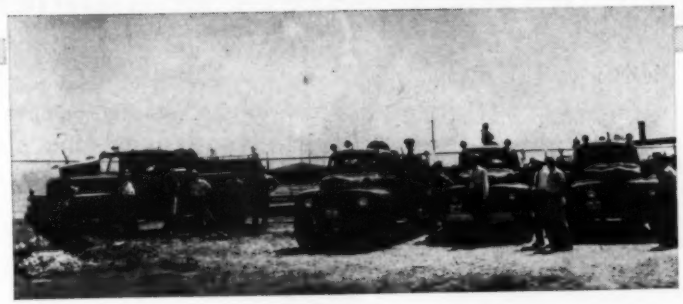


WICHITA FALLS, TEXAS, HAILS NEW HOWE APPARATUS

Like many, many other cities from coast to coast, Wichita Falls, Texas relies on Howe Fire Apparatus, as shown in the illustrations above. That's because Howe has always built dependable equipment . . . ever since 1872. Howe equipment is approved by the National Board of Fire Underwriters. High standards of workmanship and efficiency are a must. An alertness to the needs of fire fighters has enabled Howe to offer many firsts in the modernization of equipment. Have a Howe Representative give you full information on the type of equipment you need.

Write for Free literature and a Howe Catalog. *Look to Howe first for the latest in fire-fighting apparatus.* Address

Fire Department Receives Delivery of Howe Truck

Wichita Falls, Tex., July, 1953 —A new fire truck, boasting many of the newest tested fire-fighting devices, was delivered Friday to the Wichita Falls Fire Department.

The sleek machine was ordered from the Howe Fire Apparatus Company of Anderson, Ind., after the city council okayed the purchase.

Fire Chief Eugene C. White said the new truck is one in which any city in the nation could take pride. He said it would afford maximum safety to the industrial sector of the city, and that it would be placed in use at the No. 6 Station on Jefferson.

"This truck will help greatly in giving protection to the heavy industry and refinery district of Wichita Falls," Chief White commented. "We want to urge all of our citizens to see this machine. It will be at Central Station, Ninth and Ohio, for about 10 days before it is taken to the Jefferson Street Station.

This addition to the city's fire-fighting equipment brings to 12 the number serving Wichita Falls, not including the chief's car. It has a 750-gallon class "A" pumper and a 250 h.p. slow-speed Waukesha engine.

The truck is equipped with two booster reels of 150 feet each and provides two lines for one and one-half-inch hose as well as 1250 feet of two and one-half-inch hose. The cab can comfortably hold three persons.

HOWE

Member of FAM (Fire Apparatus Manufacturers Assn.)

HOWE

FIRE APPARATUS COMPANY

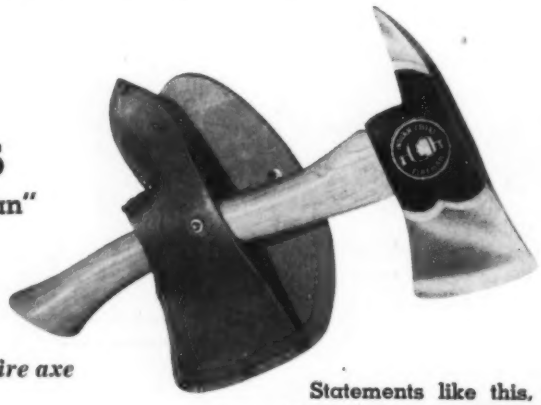
Dept. FE2, 1403 W. 22nd St., Anderson, Indiana

"...Their value has been incalculable and they are now as integral a part of each man's equipment as his helmet.

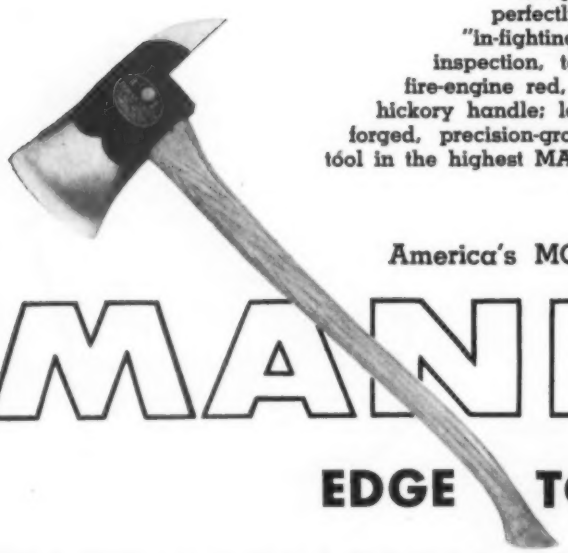
"We hope that you will call the attention of every fire fighting organization in our country to its value; not only as an excellent close-quarters fighting tool, but also as an almost indispensable item of personal safety equipment."

MANN'S
"Little Fireman"

The personal fire axe



Statements like this, from a Fire Chief's letter, come from everywhere. The "Little Fireman" meets your demand for a useful personal tool. Strap it on—it's always ready! Only 1½ lbs. of perfectly balanced, short handled axe for easy "in-fighting." It looks the part for full-dress inspection, too — brightly polished, trimmed in fire-engine red, with gold; finest quality 15-inch hickory handle; leather sheathed. A precision-forged, precision-ground and precision-finished tool in the highest MANN tradition.



America's MOST USEFUL, MOST POPULAR fire axes.

MANN

EDGE TOOL COMPANY

LEWISTOWN, PENNSYLVANIA

"fustest with the mostest"

Old General Forrest really put his finger on something when he explained that to win a battle you must "Git Thar Fustest With The Mostest."

In fire fighting, too, this practical advice holds true. Through the years our constant aim in designing and building Mack fire apparatus has been to provide fire departments with equipment that will get there first with the most.

Mack fire apparatus is the product of the most complete manufacturing facilities in the industry . . . the result of complete quality control over the construction of all components. Outstanding performance . . . efficent design . . . long-lived dependability—these qualities have won for Mack an acknowledged position of leadership in the fire apparatus field.

In planning for the future, you should consider nothing less than the finest in fire apparatus. Let a Mack representative show you how "Built By Mack" means tops in performance.

Modernize with

Mack
FIRE APPARATUS

MACK MANUFACTURING CORPORATION
Fire Apparatus Division
Allentown, Pa.

Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.

TRIPLE COMBINATION PUMPERS—500 TO 1250 GPM . . . SQUAD AND HOSE WAGONS . . . 65', 75' AND 85' AERIALS . . . COMBINATION LADDER TRUCKS

for RUGGED DUTY !

MIDWESTERN PROTECTIVE CLOTHING

The overwhelming preference for Midwestern Protective Clothing is the result of outstanding performance when the going is tough and the chips are down. The superior quality, design, fabric texture and many exclusive features found in Mackinaw Coats and other Midwestern garments help increase your department's efficiency and provide extra protection for your men at the scene of the blaze. There is no substitute for the expert workmanship, built-in comfort and longer wear you get by specifying Midwestern.

PROTECTION—COMFORT—SERVICE

You will find the type of fabric exactly suited to your needs in our wide selection of rubber materials. You can absolutely depend on the softness and flexibility of these high grade materials to meet your most exacting requirements for lasting comfort, rugged service and greater efficiency on the job.

For complete information on our full line of firemen's protective clothing, see your Midwestern dealer. A letter to the factory will also bring you literature and material samples for your inspection.

DEMAND GENUINE WITHOUT THIS TRADE MARK

MIDWESTERN MFG. CO., Mackinaw, Illinois

Manufacturers of the Famous **MACKINAW Coats**

Headquarters for Fire Department

BRASS GOODS

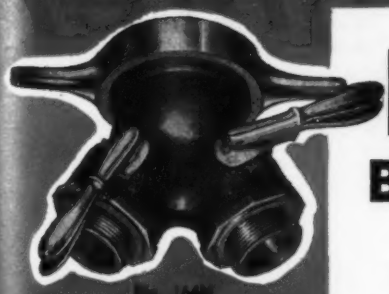


Fig. 164N
4½" swivel female x two 2½" male Gated Siamese. Quick opening, ¼ turn valves.

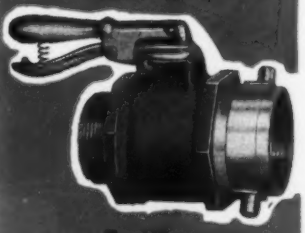


Fig. 165
Made either Right Hand or Left Hand 2½" male x female, gate valve.

McINTIRE BRASS WORKS

Pioneers in Nozzle Manufacture

ORIGINATORS

and Sole Mfrs. of

INVINCIBLE NOZZLES

We invite figuring or bidding on all types of brass work

Fig. 186
"MORSE" SHUT-OFF NOZZLE AND PLAYPIPE COMBINATION

FIREBOAT TOWER NOZZLE

Operated by Remote Control

with full Transverse Control

Figure 114-B — one of many — made by pioneers in nozzle manufacture.

AUTOMATIC-OPERATING SHUTTER AND SLIDING POLE

For the FINEST BRASS GOODS *Specify* McINTIRE

15 foot high. 6500 G.P.M. 5" tip.

F. N. McINTIRE BRASS WORKS 377 Putnam Avenue Cambridge 39, Mass.

Every inch a fire fighter

Petaluma, California, is proud of these two new L-306 Internationals. Each has 169-inch wheelbase, pumping capacity of 1250 GPM. Both are radio-equipped, powered by 275-hp engines, with five-speed transmissions. The International hook-and-ladder in the background is a 1924 model, still in service.

Every International fire truck chassis is engineered two ways to fight fires better.

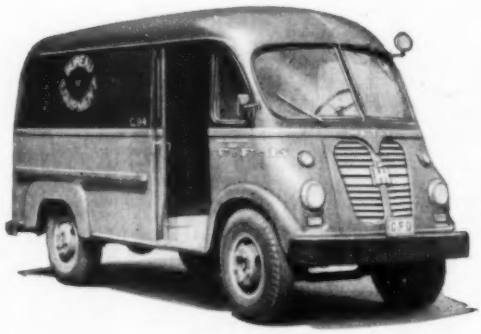
First, you gain from International's tough-job engineering. It has made International Trucks the heavy-duty sales leader for 21 straight years. That engineering gives you proved long life, lower maintenance cost.

Second, International fire truck chassis are specially designed to exceed every fire department requirement. They have flexibility, speed, and safety to spare.

You can choose from seven International fire truck chassis, with GVW ratings from 16,000 to 30,000 lbs. There are eight engines in the International fire-fighting line. Pumping capacities range from 500 to 1250 GPM.

Compare performance with other fire trucks. Compare price. Ask your International dealer or branch for more details.

INTERNATIONAL HARVESTER COMPANY • CHICAGO



To Keep the Big Red Ones Rolling. Chicago Fire Department uses two RM-150 Internationals with Metro® bodies for on-the-job maintenance. Body contains a complete repair shop, a stock of spare parts.

International Harvester Builds McCormick Farm Equipment and Farmall Tractors... Motor Trucks... Industrial Power... Refrigerators and Freezers

Better roads mean a better America

INTERNATIONAL® TRUCKS

"Standard of the Highway"

When Seconds Count!...

Count on DUO Safety FIRE LADDERS

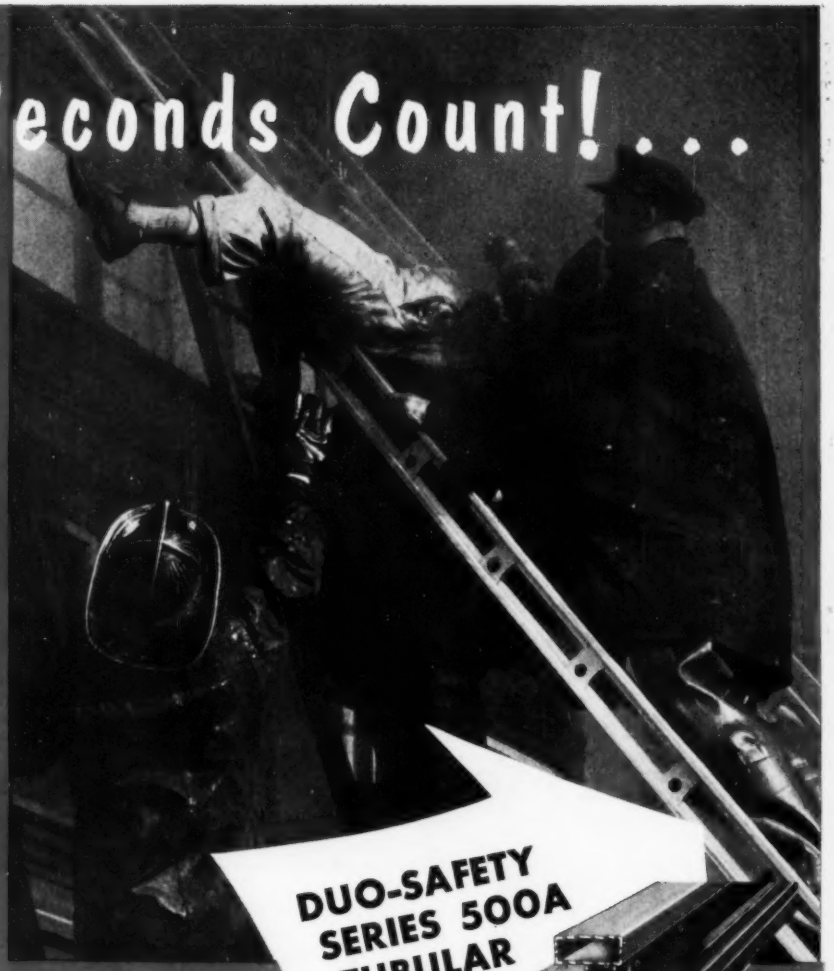


PHOTO BY PHILA. FIRE DEPT.

DUO-SAFETY SERIES 500A TUBULAR RAIL

Here's the proof, in action, of the superior quality, safety and dependability of the famous Duo-Safety line of aluminum fire ladders. The ladder in the above photograph, playing such an important part in the rescue of an unconscious victim, is the Duo-Safety 500 Series Tubular Rail Model. Note how straight and sturdy the rails remain, even under extreme weight. Note, too, that the absence of any projections or sharp, jagged edges provides a smooth rail surface to permit sliding the victim down safely and rapidly. Yes . . . you can count on all ladders in the great Duo-Safety line for the kind of performance that only highest quality delivers. Write today for free, colorful file catalog giving complete information.

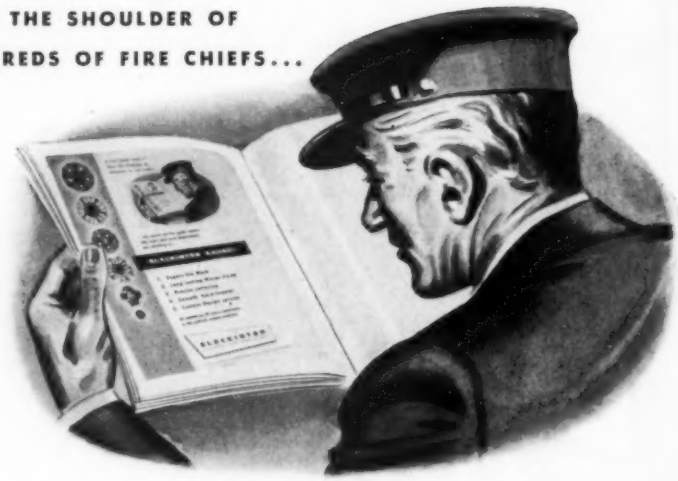
DUO-SAFETY LADDER CORP.

809 NINTH STREET, OSHKOSH, WIS.

ILLUSTRATIONS SHOWN ⅜ ACTUAL SIZE

Blackinton's popular Cap, Collar, and Lapel Insignia available in several finishes—all with colorful hard enamel centers. Ask your supplier to show you the complete line of BLACKINTON BADGES the next time he calls. Be sure to specify BLACKINTON BADGES.

IF YOU COULD LOOK
OVER THE SHOULDER OF
HUNDREDS OF FIRE CHIEFS...



—you would see five good reasons why more and more departments are switching to—

BLACKINTON BADGES

1. *Expert Die Work*
2. *Long Lasting Mirror Finish*
3. *Precise Lettering*
4. *Smooth, Hard Enamel*
5. *Custom Design Service*

All backed by 101 years experience in the uniform insignia business.

BLACKINTON
V. H. BLACKINTON & CO., INC., ATTLEBORO FALLS, MASS.

New spray ends fire that burned two days!

"There was a blue flash, a sound like thunder . . . a small flame. Then the building collapsed, was a mass of flames in five minutes . . ."

On Monday afternoon, June 22, Philadelphia found itself with a seven-alarm fire—4,000 tons of Government stockpiled crude rubber burning in a collapsed five story warehouse.

A Civic Emergency, the first in Philadelphia's history, was declared. Two areas adjoining the fire were evacuated. Over a hundred men were treated for burns, cuts, asphyxiation, Monday afternoon.

Foam and fog application failed to stop the fire. Late Tuesday night, hundred feet high flames were still rising from the burning rubber.

Then Central Supply Equipment Co. suggested the use of "Rockwood Wet," a detergent that makes "water wetter." Deputy Fire Chief George E. Hink agreed to try it. Central Supply had little on hand, and phoned its supplier, Rockwood Sprinkler Co., at Worcester, Mass. Rockwood called General Aniline, which makes the chemical.

At the GAF plant in Linden, N. J., an emergency crew came in at 11 p.m., worked all night to deliver 2,250 gallons of the chemical base in Philadelphia the next morning. Spraying of "Rockwood Wet" a gallon to each hundred gallons of water, started at 11:00 a.m. *In one hour and fifty-two minutes, the two-day fire was out.*

General Aniline & Film research continues to work for your use, comfort, safety.

With plants at Rensselaer, N. Y. and Grasselli, N. J., GAF is the largest US producer of quality dyestuffs, and an important supplier of industrial chemicals(*sold through General Dyestuff Corporation*) . . . The Ansco Division, Binghamton, N. Y. is the country's second largest maker of photographic film, papers, and cameras . . . The Ozalid® Division, Johnson City, N. Y. manufactures Ozalid facsimile reproducing machines, and sensitized paper.

General Aniline is an indispensable industry... worth knowing and watching.

gaf General Aniline & Film Corporation

. . . From Research to Reality

230 Park Avenue, New York 17, N.Y.

Reliability in *Automatic* fire detection depends on the degree and quality of...

Most important in considering automatic fire detection and alarm systems are the factors which assure the highest degree of reliability. Without provisions for continuous supervision, inspections, tests and complete maintenance, even the most perfectly designed equipment cannot be depended upon to function properly when an emergency arises.

Bulletin No. 261 of the National Board of Fire Underwriters says: "Experience has been that constant supervision, as rendered by companies maintaining a central supervising office, and under contract to inspect, test and maintain the system, *is the best form of service;* also, that where such central supervision is not available, then the inspections, testing and maintenance should be under contract with an experienced and dependable organization."

ADT Protection — based on more than fifty years of nationwide experience—completely meets these requirements. Whether the system operates through an ADT Central Station or is of the direct-connected type, ADT provides the specialized attention that is essential to dependable operation.

Write for complete information concerning ADT Sprinkler Supervisory and Waterflow Alarm Service or Automatic Fire Detection and Alarm Service. We shall be glad to explain how these and other ADT Automatic Protection Services can be applied to give better protection at lower cost.

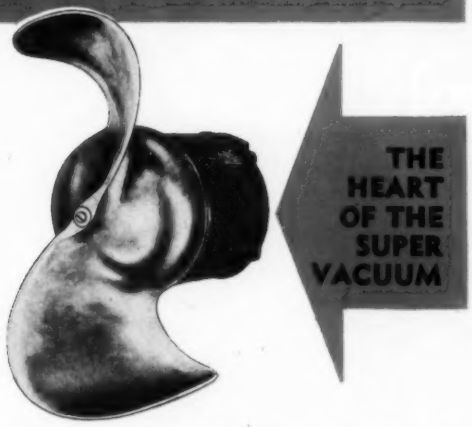
Controlled Companies of **ADT**

AMERICAN DISTRICT TELEGRAPH COMPANY
155 Sixth Avenue, New York 13, N. Y.
Central Stations in Principal Cities

Super Vacuum ..... THE ANSWER TO YOUR SMOKE EJECTION PROBLEMS

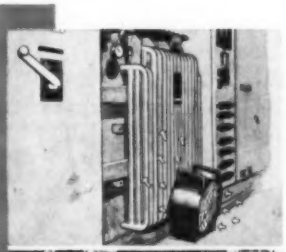
• REVOLUTIONARY NEW PRINCIPLE INCREASES FIRE FIGHTING EFFICIENCY!

•The Super Vacuum Smoke ejector is a powerful portable fan unit designed especially for fire departments. This design is a new and revolutionary principle in moving air. Several thousand Super Vacuum Smoke ejectors are in use throughout the United States and Canada. Controlled ventilation is new and very necessary in fire fighting. Years of service and satisfied users are your best guarantee for any merchandise.



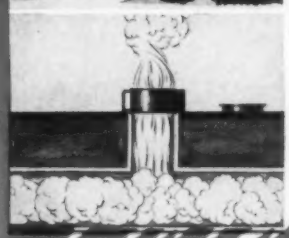
•The secret of Super Vacuum is the patented fan blade. Conventional fans chop the air and push it back. Whereas the Super Vacuum fan blade is a perfect spiral air screw which creates a partial vacuum, suction is created over the entire face of the blade and the air or smoke is discharged in a high velocity spiral. There are no dead spots—that is why Super Vacuum outperforms other fans twice its size.

TYPICAL USES

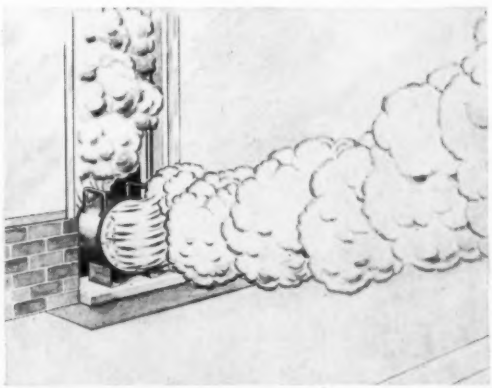


•Super Vacuum ejectors are often used by fire departments in emergencies to cool generators, pumps and motors. The strong discharge of air quickly reduces the temperature to a safe level.

•Fresh air can be forced into a building with or without a deodorant. By applying deodorant to a pad and attaching it to the intake face of the Super Vacuum fan, air is pulled through this pad and forced throughout the building. Smoke odors are dissipated and soot is settled.



•Poisonous or explosive gases can be effectively removed from sewers, basements, tunnels and mine shafts with the Super Vacuum Fans. They can be used in any position horizontal or vertical.



•Smoke ejection is a major problem at most fires. Super Vacuum does it faster, cheaper and more efficiently than any similar device on the market. As a Nationally known Fire Chief said recently, "Smoke ejectors are as necessary as fire hose in fighting fires."

Write for Additional Information or Contact Your Local Fire Equipment Dealer

MANUFACTURED EXCLUSIVELY BY

Super Vacuum MANUFACTURING CO.

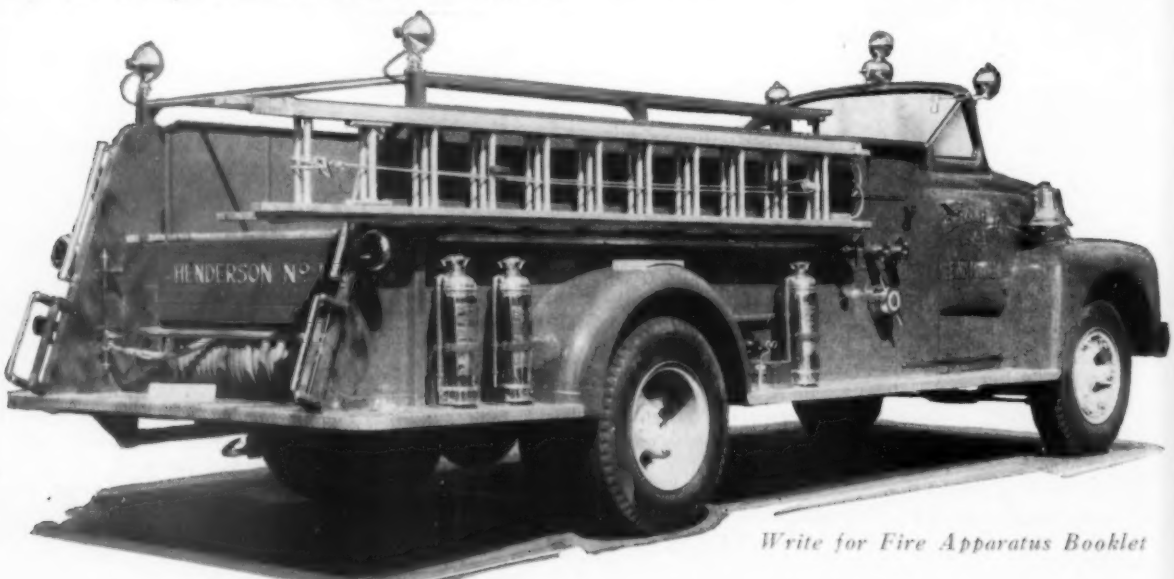
319 East 17th Avenue • Denver 3, Colorado

There Is A DARLEY CHAMPION for Every City and Rural Fire Service

750 GALLON UNDERWRITER PERFORMANCE PLUS HIGH PRESSURE FOG

A highly efficient pumper apparatus with the Champion Three Stage Centrifugal Pump powered by International. The Pump is the Type SH750 which delivers 750 gallon Underwriter performance plus 60 gallons per minute at 850 lbs. for high pressure fog.

Or this Darley Apparatus is also available in Underwriter capacities of 600 GPM and 500 GPM. Modern commercial truck motors have adequate power for either 750,600 or 500 GPM pumps.



Write for Fire Apparatus Booklet

AT YOUR SERVICE: Sales and Service Representatives—East, Midwest, North, South

ESTABLISHED 1908

High Pressure Fog Pumps

W. S. DARLEY & CO., Chicago 12

Front and Midship Pumps

Factories — Chicago and Chippewa Falls, Wis.

PROTECTOSEAL

Builds a COMPLETE LINE of APPROVED SAFETY EQUIPMENT FOR THE Storage, Transfer and Use of Flammable Liquids!

STORAGE

CONSERVATION VENTS AND FLAME ARRESTERS

provide pressure and vacuum relief, and breathing is retarded to reduce evaporation. Flame Arresters prevent passage of flame to interiors. All aluminum construction, or special materials on order. Approved and listed by Underwriter's Laboratories and Associated Factory Mutual Laboratories.

DRUM BUNG FITTING

a combination fill and vent which provides vacuum and automatic pressure relief, and guards against explosion under fire conditions. Double perforated metal baffle extends into drum and permits refilling without danger of interior fire.

SELF-CLOSING AUTOMATIC FAUCET

has flame arrester within the body at outlet; valve is outside body where it is not distorted by excessive pressure. Standard gaskets are Buna N, Neoprene or Thiokol; other materials upon request.

TRANSFER

SAFETY TRANSFER PUMP

Designed for complete protection against explosion and fire hazards the PROTECTOSEAL Transfer Pump has three flame arresters built into it: at the spout, above the bung adapter and at the strainer inlet within the drum. It also provides for vent and pressure relief through protected openings.

The pump is self-priming and is constructed of special aluminum alloy with a brass telescopic tube. It is quickly and easily attached to drums with bung openings as small as ¾" by hand swivel grip connectors and the telescopic tube permits pumping from either the side or end openings of 30 gallon and 55 gallon drums.

PLANT USE

A—SAFETY CANS—Double concentric fire baffle inside base of spout. Spring loaded cap makes tight closure; provides pressure relief. Explosion-proof and leak-proof.

B—PLUNGER CANS—When plunger is depressed, the fluid rises into dasher to moisten swab. Excess liquid flows back into body. Dasher is a fire-protective baffle and unit is self-extinguishing.

C—WASH-DIP TANKS
Sturdy, square, electrically seam-welded design with lugs above liquid level to hold basket for draining. Top has full-length hinge and is equipped with a fusible link which drops cover automatically in case of fire.

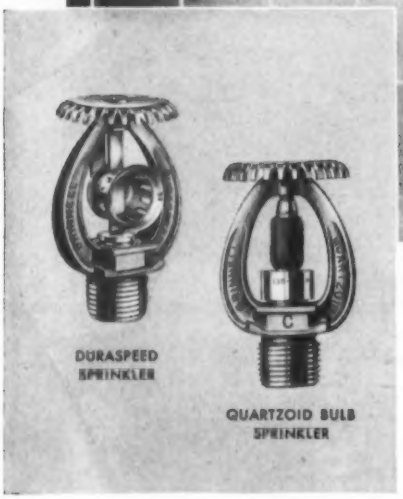
D—OILY WASTE CAN
Tight, seam-welded body with snug fitting cover which closes automatically to smother fire. Cover opens wide with slight foot pressure on full width treadle.

THE PROTECTOSEAL COMPANY
1946 So. WESTERN AVENUE, CHICAGO 9, ILL.

Please send complete catalogs and price lists on the types of PROTECTOSEAL Safety Equipment checked:

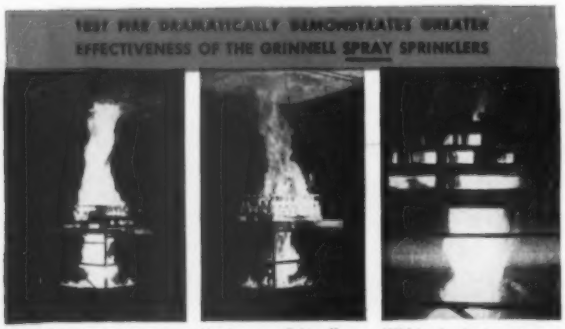
☐ Bulk and Drum Storage ☐ Transfer Pump
☐ Safety Production Cans for Plant Use

Name_____ Title_____
Company_____
Address_____
City_____ Zone_____ State_____



Features: approved by Factory Mutual Laboratories; listed by Underwriters' Laboratories, Inc. • interchangeable with conventional sprinklers • unexcelled release mechanisms.

Put out *MORE FIRE* with *LESS WATER*



Test fire is under way. Under the wood crib is a torch fed by a constant flow of gasoline which prevents extinguishment of the fire. The vapors distilled off from both wood crib and gasoline torch feed the flames which lick ceiling panel.

Heat opens Grinnell upright spray sprinklers. Flame column starts to thin out and break up under the attack of fine sprays. Water vapor from these sprays dilutes the flammable fire gases to extinguish the destructive flames.

Within 4 minutes, sprays have practically killed the fire. After 30 minutes, with torch still roasting wood crib, it was far from destroyed. Ceiling panel was only slightly flame-blackened — even though no water was directed against it.

GRINNELL AUTOMATIC SPRAY SPRINKLERS

provide:

- better protection — the greater the hazard, the greater the improvement in protection
- improved water distribution —*less* water puts out *more* fire.
- more uniform coverage— from multiple operation or from a single sprinkler
- more effective ceiling protection—without wetting the ceiling
- lowered ceiling temperatures —no unnecessary sprinkler openings

why:

- cool fire gases to prevent fire from spreading—by the faster evaporation of the smaller water droplets
- control fire by producing an unburnable mixture of flammable vapors and water vapor
- dilute and diminish supply of flammable vapors with water vapor . . . evaporation of water removes heat, stops the distillation of the flammable vapors from solids—and from many liquids

Send for booklet describing Grinnell Spray Sprinklers in detail.
Grinnell Company, Inc., Providence, R. I.
Sales offices in principal cities.

GRINNELL
FIRE PROTECTION SYSTEMS

Manufacturing, Engineering and Installation of Automatic Sprinklers Since 1878

IT'S TOPS

. . . the noticeably better performance of American Fire Hose is the natural result of skillful, painstaking manufacture. American does not compromise with quality—as a result critical buyers eventually standardize on American.

LAMINATED CONSTRUCTION
5 . . . calendered sheets

CRACKERJACK

MUNICIPAL FIRE HOSE

OTHER AMERICAN BRANDS

WHITE	*TREATED
Crackerjack	Crackerjack-Arcolized
American	American-Arcolized
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Underwriters	Underwriters-Arcolized

Fully guaranteed against mildew and rot; water repellent.

FLEXIBLE . . . balanced weave and premium yarn assure greatest strength and flexibility.

SMOOTH WATERWAY . . . lowest possible friction loss.

DEPENDABLE . . . unsurpassed for ruggedness and long life.

LOWEST COST PER FOOT PER YEAR

ASK FOR BULLETIN

Descriptive literature is available on American Fire Hose. Ask for your copy—no obligation.

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Write for name and address of your nearest American Distributor

THE AMERICAN RUBBER MFG CO. • OAKLAND CALIF. •

How much a box per person for the small community?

Let's start with a community of less than 50,000 people.

Would you guess that a Fire Alarm System might cost $2.00 a person per year? Or would you say $5.00 a box per person?

A survey of several communities shows that the *average annual cost* for a municipally-owned Fire Alarm System is only 75¢ per person. And that figure includes maintenance of the entire system.

Looking at it another way, a single fire doing $40,000 worth of damage could cost more per person than the Alarm System which could have reduced or completely eliminated the loss.

For a survey of your community's Fire Alarm needs, get in touch with Gamewell. The survey will cost you nothing unless and until you buy materials or services from us.

THE GAMEWELL COMPANY

NEWTON UPPER FALLS 64, MASSACHUSETTS

In Canada: Northern Electric Co., Ltd.

SPARKY SAYS:

"Last year's fire loss amounted to over $896,000,000. — most of it needless waste."

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GAMEWELL®

THE BOX IS POSITIVE

Reduces Human Error

SEPTEMBER, 1953

FIRE ENGINEERING

VOL. 106, NO. 9

With the Editor

"Traveling" Fire Alarm Signal Stations

The other night an airline pilot discovered a rural fire, radioed an alarm, and firemen were on the scene in time to save lives and property. A few days before, the press told about a lumber yard fire, which was discovered in the early hours of the morning by a taxicab driver, who radioed an alarm to his company dispatcher to set the fire department in motion.

These and countless other similar incidents wherein the occupant of a radio-equipped vehicle came across a fire and sounded an alarm lead us to wonder if, in our contemplation of the importance of early detection of fire and transmitting of fire alarms, we are overlooking a bet?

Most of us have a high regard for the public fire alarm system with its street boxes (the more the better). Most of us will give the telephone its due as a means of fire communications. Most of us who have ever used mobile two- or three-way radio in our departments will laud its merits. But few of us, we believe, have ever weighed the full impact on our fire service of the large army of vehicles, planes, trains and boats of all types, moving day and night over our interminable highways, byways, railways, waterways and airways.

Most of us, for example, don't realize that there are at this writing some 4,069 radio systems serving the taxicab industry alone; that there are 973 railroad radio systems in operation, and that in what is known as the Highway Maintenance group there are 616 base and mobile systems at work. Nor do we hear much about the Power Utility group, but it includes some 5,600 base stations and 60,500 mobile radio equipped units! All this apart from Fire, and Police, and the other safety services which muster another 100,000-plus mobile radio outfits!

Put it all together and we understand there are nearly *half a million radio outfitted motor vehicles, railroad trains, airplanes and other users eating up the miles round the clock, from coast to coast and Canada to Florida,* all of them in contact with base dispatchers who in turn are or can be, in touch with the fire forces everywhere along their route—each a veritable traveling fire alarm box! More than that, because some of these radio users have at their beck and call first aid fire extinguishers, they constitute an effective auxiliary fire force, of sorts.

Nobody knows how many miles these radio-equipped vehicles and other moving units travel during the day and night, in this country. Nobody knows just how many farms, dwellings, institutions, dwellings, wharves, and places of business daily come under the eye of the drivers of these moving conveyances.

All we know is that: (a) the number of alarms of fire or other emergency involving the fire service emanating from this source is on the increase, and (b) the number of radio-equipped mobile units of all types and kinds is likewise growing. There could conceivably be some connection between these two observations.

We know, also, that the number of fire alarms transmitted by taxicab drivers, truckers, and other radio users, sent in via street box and telephone as well as over their own radio is on the increase. It is not unusual to read of rescues made in the early hours of the morning by truckers who, having come across a fire, radioed for help, and then went to the rescue, again augmenting the work of the fire fighter.

Perhaps one of the reasons these "portable fire alarm systems" are not of more value to the fire service is that we have failed to make fullest possible use of them. How many of these vehicle owners, and drivers, have ever had any direct contact with fire chiefs? How many have ever had any coaching on just how they might be a bit more alert for fire, and coached on just how they might best serve the interests of the fire service when and if they discover a fire, or come upon an emergency?

Just how many fire officers, for example, have any idea of the total extent of the portable or mobile radio installations in use in their own protective area, and how this communications asset might be essential to them in time of major disaster? Also, how many have sat down with the managers and heads of these radio-equipped fleets and other transportation units, with a view to enlisting the latter's employes in the great problem of fire detection and protection?

Perhaps this might well be a project for the International Association of Fire Chiefs to pursue.

Fred Shemwell

Fire Resistive Construction Made Vulnerable By Contents

Grease Processing and Packing Plant Severely Damaged by Fire Despite Sturdy Construction

By D. M. BAIRD*

THE relationship between fire resistive construction and the contents of the building as well as the dangers of exposure of the fire resistive building to combustible neighbors was emphatically demonstrated in a recent disastrous fire in Montreal which resulted in the loss of a million dollar grease compounding and motor oil packing plant of the Canadian Oil Companies Ltd.

The fire, fought actively through the night of April 28, 1953, by a strong force of the Montreal Fire Department, raced quickly through the brick and wood lubrication building and, by its very intensity and speed, gained the upper hand over the fire fighters and a barrier of firedoors and wired-glass windows to consume the contents of a new reinforced concrete structure housing the grease compounding plant and storage. The course of destruction was completed when most of the latter building, weakened by the heat of flaming oil and grease stocks, collapsed in a heap of rubble. Early estimates of the total loss of buildings and contents were set at more than $2 million.

Early in the fire, firemen maneuver an aerial into position for the vain attempt to protect windows of the grease plant as flames already roar through the roof of the lubrication building.

Large crowds were attracted to the scene, an oil refinery and industrial area on the east side of the city, by a tremendous pillar of black smoke and the roaring flames, which, at the height of the fire whistled like the sound of a jet plane and gave the appearance of a gigantic blowtorch. Fearing an explosion, strong police forces held onlookers at a distance. Luckily there was none, and only minor casualties resulted.

For firemen it was frustration to fight a fire which seemed undeterred by their greatest efforts and to see a reinforced concrete structure "burn down." For fire protection engineers, the fire poses the question of what more can reasonably be done in building construction to prevent such losses.

An aerial view taken the day after the fire, showing the ruins of the lubrication plant in the center, with its battery of blending tanks which comprised the hot spot of the blaze. What remains of the reinforced concrete grease compounding plant shows at right.

The lubrication and grease plant of Canadian Oil Companies Ltd. was located in an industrial district alongside the St. Lawrence River and was a part of the large oil and gasoline tank farm and distributing depot of the company. The plant consisted of two sections, the older lubrication plant building and the grease plant and warehouse which was added to it in 1951. The older building measured about 70 by 150 feet, and was one and two stories with basement, of brick faced tile construction with a light wooden roof set on a frame of 12-inch wooden beams and posts protected by plaster. Floors were mill type and, in part, concrete.

Built around two sides of the lubrication plant in an L-shape was a three-story and basement fire resistive grease compounding and packing plant of modern type. It consisted of a reinforced concrete frame, using 12-inch and larger columns, with poured reinforced concrete floors and roof slab. Walls were constructed of hollow concrete blocks, a brick facing being used on the front. Building was about 190 by 220 feet.

On the east side of the new building, where the two adjoined, the brick and tile wall of the lube plant acted as a common wall on the ground floor. In

*Fire Protection Engineering Department, Dominion Board of Insurance Underwriters, Montreal, Que.

Fire progresses relentlessly through the heavy stocks of grease and oils. Photo taken as fire breaks through west wall of grease plant about the time firemen withdrew from the building. Million gallon fuel oil tank at right.

this wall were a number of openings fitted with self-closing, standard wood-core firedoors or wired glass windows with metal sashes. In the wall of the grease plant overlooking the roof of the lower building there were wired glass windows in metal sashes on both second and third floors. The fire resistive section was not subdivided, but was a single large floor area on all floors.

The older building housed a laboratory, cafeteria and the motor oil blending and packaging machinery processes. Several large blending tanks and six 10,000-gallon tanks were located at the south end, on the inside corner of the "L". The grease plant held the grease process and packing facilities on upper floors and considerable quantities of grease and oil in storage, much of it canned and in cases. Shipping facilities occupied the ground floor and a drum cleaning section was located in the basement. Activities in the plants consisted of blending and packing oil and grease for distribution under the trade name White Rose. Petroleum products were pumped in as required from various storage tanks about 100 feet to the east.

Serious Exposure Threat

Exposures to the fire buildings included eight gasoline tanks of about 12,000 gallons capacity each 100 feet to the north. Various large oil and gasoline tanks were located 100 feet or more to the east. Large numbers of empty drums were stacked adjacent to the east wall. A one million gallon, nearly empty fuel oil tank was only 20 feet from the west wall near its north end. A small truck garage stands about 20 feet to the north. Aside from these company facilities, there were no exposed buildings within 500 or more feet. South of the plant is the river. A light north wind was blowing during the fire.

Discovery of the fire was reported to be by a company truck driver checking in at the oil terminal at about 6 p.m. The regular plant shift had left at 4:30. The driver observed smoke issuing from a ventilator on the east side of the lube plant. He notified the night watchman and engineer, then sent in the alarm from a private box of the Dominion Electric Protection Co. service. At the same time the alarm was telephoned to the Montreal Fire Department.

These employees report being unable to enter the lubrication plant even at this time, due to the heavy generation of smoke from the direction of the laboratory at the north end. The watchman had already made one round of his stations, according to the protection company's tape records, and the plant engineer stated that he made a security check of the building after operations stopped for the day.

The fire department recorded the telephone alarm at 6:18 p.m. and the D.E.P. alarm at 6:19. The first alarm assignment was despatched promptly under the direction of a District Chief. The chief of the plant fire brigade, the company manager and the electrician also responded immediately. Basement valves on pipelines leading to the outside storage tanks were closed and a quick survey of the plant was made with the chief.

Finding the lube plant heavily involved with fire, the chief in charge ordered a second alarm. With the arrival of the additional forces, a line of attack was set up in the ground floor of the grease plant, heavy fog streams being operated through the firedoors which were already showing serious effects of the intense fire on the other side. At the same time large streams were brought into play on the east side and a ladder stream employed to protect the wall of the grease plant as the light wooden roof of the lube plant had given way and the flames were rolling skyward, endangering the windows of resistive building.

At 6:45, four pumper and two hose companies were special called by fire department Director R. E. Pare who had taken charge. It was necessary for pumpers to hook up at hydrants located at considerable distances from the fire building and three were sent to draft from a wharf on the river bank, a few hundred feet to the south. Good streams were developed although pumpers were drafting at a lift of nearly twenty feet.

Fog Used Inside

Although good headway was made against the fire with the 500 G.P.M. fog streams operating inside, a terrific torch of flame began to issue from around a closed firedoor far south in the grease plant, at a point opposite the storage and blending tanks of the lube plant. The raging fire in the lube plant was developing with such intensity that firemen were unable to place heavy streams quickly enough to cover all exposures between as well as outside the two structures. Hand lines were ineffective.

It was soon discovered that lines could not be taken into the upper floors of the grease plant as a heavy charge of smoke was building up, apparently as fire penetrated the wired glass windows. Front windows were vented and attempts made to drive the fire back from the outside with heavy solid streams,

(*Continued on Page* 885)

A closeup of part of the ruins, with the grease plant in the foreground and the oil blending tanks of the lubrication plant at right. Several concrete columns may be seen standing while the floors have fallen away from them.

Thirteen Separate Fires Give Fresno Department Severe Test

Mutual Aid Response Provides Sufficient Apparatus and Personnel to Handle Major Fire Problem

By GAYLE V. COGER
Chief, Fresno Fire Dept.

ON Friday afternoon, July 10th, the fire defenses of the City of Fresno, Calif., experienced their severest test in a series of fires in thirteen of the major downtown buildings, mostly hotels and apartment houses. In addition to that the department was called upon to check on many exaggerated and erroneous calls occurring between the hours of 1:45 P.M. and 8:00 A.M. the following morning.

The sequence in which these alarms were received is as follows:

1. 1:45 P.M. Hughes Hotel, Tulare and Broadway.
2. 1:54 P.M. Adams Hotel, Kern and Broadway.
   1:55 P.M. Golden Hotel, Kern and Broadway.
3. 2:06 P.M. Gottschalks Department Store, Kern and Fulton.
   2:07 P.M. Californian Hotel, Van Ness and Kern.
4. 2:29 P.M. Sequoia Hotel, Tulare and Van Ness.
5. 2:40 P.M. Alta Apartments, Kern and M Sts.
6. 3:27 P.M. Brix Apartments, 2311 Fresno St.
7. 3:49 P.M. First Christian Church, Tuolumne and M Sts.
8. 3:54 P.M. Mission Hotel, 1200 Blk. Broadway.
   3:55 P.M. Roslyn Hotel, 1200 Blk. Broadway.
   3:56 P.M. Art Gallery, 1200 Blk. Fulton.
9. 5:34 P.M. Bonner Packing Co., 2000 Blk. Parallel.
10. 6:32 P.M. Fresno Air Terminal, Hammer Field.
11. 8:33 P.M. Inyo and M Sts.
12. 8:42 P.M. California and Channing.

Three of these fires were major in nature and required substantial fire fighting personnel and equipment over a sustained period of time. Statistical report follows:

Hughes Hotel Fire

1. The Hughes Hotel, at Tulare and Broadway, was a large 4-story, 3rd class hotel, 66 years old, oblong in shape and occupied about a quarter of a block. Telephone call was received from a lady that there was a fire in hotel. Also two street boxes were pulled simultaneously.

1:45 P.M.—Box 2232 transmitted, with Engines 2, 3 & # 1; Trucks 2 & 1; Water Tank 1 and Chiefs 2 & 1 responding.

6-6 atl:52 P.M. for Engines 7 & 4.

6-6 atl:53 for Truck 3.

6-6 atl:1:59 P.M. for Engines 9 & 5.

2 Mutual aid pumpers responded (Mid-Valley Fire District).

Number of engines worked	7
Number of Trucks worked	3
Number of 2½" lines laid	23
Number of 3" lines laid	4
Total footage of 2½" lines	12,200
Total footage of 3" lines	1,600
Engines pumped a total of 36 hours	
Number of deck pipes used	3
Number Multiversals used	4
Number ladder pipes used	1
Ground ladders used	621 ft.
Number of men on duty responded	71
Number of men off-duty responded	77
Total	148

Total amount of water used, 1,875,180 gallons.

Total amount of water used ..... 1,875,180 gal.

Hughes Hotel fire, Fresno, Calif., shortly after fire fighting forces started operations. This was the largest of thirteen fires which occurred within a seven-hour period. Arson is suspected.

Brix Apartments Fire

2. 3:27 P.M. Phone call, Brix Apartments on fire, Fresno and M Sts. A large 4-story, wood joist, tar paper roof, oblong in shape, about 300 ft. x 150 ft. apartment house.

Fresno Reserve engine with off-duty firemen dispatched and six Mutual Aid engine companies sent by telephone. Three Truck Companies responded (two Fresno Fire Department trucks sent from the Hughes Hotel and one filled in from Madera, Calif.).

Number of 2½" lines laid, 12; total hose used, 7,600 ft.

One hundred ninety-six ft. ground ladders used.

One Multiversal used.

Forty-two tarpaulins used and everything on second and third floors completely covered, and suffered very little damage.

Number of firemen responded, 73.

Number sent from Hughes Hotel fire, 12; total, 85.

Gallons of water used, 562,600 gallons.

Companies began to shut down at this fire at approximately 5:30 P.M. By 9:00 all companies were removed with exception of one Fresno City Reserve pumper, which stood by throughout the night.

In addition to above equipment which worked, there were seven pieces of equipment standing by and the personnel assisted in salvage work at the Brix and a few moments later were dispatched from the Brix to the First Christian Church.

First Christian Church Fire

3. 3:49 P.M. phone, First Christian Church on fire. This church was an old brick church.

Six Mutual Aid pumpers.

A total of 1,500 ft. of 2½" hose laid.

Personnel—24.

31,000 gallons of water used.

Basement of church fully involved and fire was confined to the basement and

the floor and walls immediately above.

On arrival at the Hughes Hotel it was apparent from the nature of the structure and the progress the fire had made that the Fresno Fire Department would be very busy for several hours. Calls were immediately made for additional help, including all off-duty firemen. Also calls were placed for the North Central Fire District and Mid-Valley Fire District, with which we have mutual aid agreements, for all available equipment for standby purposes in our Stations should other fires occur. As the situation developed, additional calls were made to various Cities within a radius of 40 to 50 miles from Fresno for help, and in every case the equipment and personnel responded in amounts greater than we expected.

At 3:27 P.M. we received the call that the Brix Apartments was on fire. A few moments later the Assistant Chief informed us by radio that we had a major fire in the Brix Apartments, and that we had a life problem and needed ladders, resuscitation equipment and masks. We immediately dispatched two truck companies from the Hughes Hotel to the Brix Apartments.

At 3:30 P.M. we had all local radio stations called and asked them to announce over the radio a request by the Fire Department that the public shut off all water in their vicinity. People were very cooperative and our water pressure began to increase immediately and rose steadily from an average of 29 lbs. to 40 lbs. in about 1½ hours. We checked this report for accuracy and found that the city of Fresno used approximately 79 million gallons of water on Wednesday and Thursday prior to the fires and only used 59 million gallons on the date of the fire. We had hundreds of calls the following day asking if it was all right to resume normal use of water. We are more than pleased with the action that we took in securing our water supply and we feel that no Chief should overlook taking similar action under similar circumstances.

During the first hour and a half at the Hughes fire we used the strategy of offense. The fire was fought entirely during that time by 2½" lines inside the building, room by room, hallway by hallway. On receipt of information on the fire at the Brix Apartments and the necessity for dispensing some equipment and personnel from the Hughes to the Brix, it became necessary to go on the defense at the Hughes. Heavy stream appliances had already been located in anticipation of this change in strategy and were very quickly put into operation. We cannot say too much for hose clamps, which were used very freely in making this transition.

Later in the afternoon the problem of getting companies back into service and relieving equipment and personnel of those communities which had so graciously furnished us same began. We were able to use several commercial trucks belonging to the Public Works Department of the city and volunteer help was put to work breaking and draining hose lines and retrieving fire equipment of all kinds at the various fires which was no longer needed. All this equipment was loaded on the trucks and removed to a central depot located on the Drill yard near our shop, where minor repairs could be effected when necessary. When pumping engines were no longer needed at various fires, they were taken from hydrants and sent to the central depot where they were outfitted again and put into service. This procedure was very satisfactory from a standpoint of time.

We began to shut down some engines at both the Hughes and the Brix fires about 6:00 P.M. and by midnight all equipment was removed from the fires with the exception of two pieces at the Hughes and one at the Brix apartments, which were being used for standby purposes during the night. All Mutual Aid equipment and personnel were returned to various communities beginning early in the evening and finished by midnight. We received from various communities and fire districts 31 pieces of equipment and a total personnel of 133 men. The total pumpage provided was 15,020 g.p.m.

This equipment began arriving in Fresno at about 2:05 P.M. and continued arriving until about 4:00 P.M., at which time we did not need any further assistance. Several cities, including Bakersfield and Sacramento, were standing by and were in contact with us by telephone to send further aid if the City desired it. All this equipment, including our own, did not suffer a single accident in its movement into and through the City. However, some minor equipment was lost.

Our communication system worked well and at no time during this entire period was our Bureau of Fire Alarm out of touch with the Chief or any other fire fighting equipment or personnel within the City of Fresno. We used our radio and alarm system in handling Fresno City equipment. Mid-Valley and North Central supplied us with receivers and transmitters for the movement of their equipment. The benefits derived from a Chief's Operator equipped with a walkie-talkie can not be overestimated. He was able to give the answer to every question concerning the additional fires.

All in all, about 39 organizations took active part in this emergency, including about 200 police officers, augmented with 250 Legionnaires and auxiliary police, and 175 National Guardsmen. All places of assembly were shut down and emptied and kept closed during the night. The radio stations warned all people to be on the lookout and not permit people not properly identified to enter hotels or elevators in the prominent buildings. All restrictions relative to assemblage and the normal conduct of affairs was restored at 8:00 A.M. the following morning. We feel that this was a very sound move due to the fire consciousness of the people. Due to this action, we had no signs of panic or hysteria on the part of our civilian population during this crisis.

There was no serious injuries to any civilian or fire fighting personnel during the entire period. However, approximately 25 firemen were overcome by smoke and heat exhaustion. The temperature at the time of the fire was approximately 102° with a 12 or 15-mile per hour northwest wind. Entire off-duty personnel responded, except those sick and on vacation and all were held on duty until 12:00 noon the following day. At that time company strength was reduced to its normal complement.

Too much cannot be said for special appliances, such as resuscitation equipment, masks, hose clamps, walkie-

(*Continued on page* 887)

Initial fire control efforts were carried on entirely within the Hughes Hotel until succeeding fires made necessary the withdrawal of some equipment and personnel. Thereafter heavy streams were put into operation from outside.

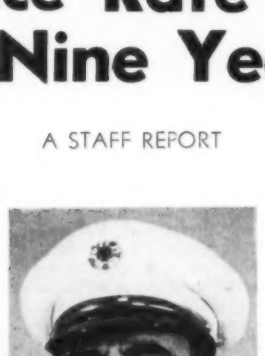
Building of a Modern Fire Service in Puerto Rico Brings

Six Insurance Rate Reductions in Nine Years

A STAFF REPORT

The Commonwealth of Puerto Rico can today boast of a fire service that is second to none. It was not always thus. Ten years ago only three of the 77 municipalities on the island had fire stations, equipment and trained fire fighters. Today nearly every city and town in Puerto Rico has one or more well-equipped stations, and by 1954 none will be without at least one. And a modern fire college, plus an island-wide fire training program, has brought about a thoroughly trained personnel.

Credit for this remarkable achievement in fire defense falls largely to one individual—Chief Raúl Gándara, head of the Insular Fire Service of Puerto Rico. How he engineered a major fire department improvement program with limited funds is told in the following article—Editor.



Chief Raúl Gándara

BY THE standards of fellow fire-fighting citizens in the United States, the Fire Service of the Commonwealth of Puerto Rico is a young organization. Its growth has paralleled the growth of the island over the last decade, wherein all facets of daily life have been improved to a peak not before believed attainable.

Under the impetus of the Commonwealth government's "Operation Bootstrap," economic development program, Puerto Rico is undergoing a vast change, rooted deeply in the expanding industrialization of the island. Since 1948, some 250 new factories have been established, bringing direct and indirect jobs to nearly 40,000 persons. Multi-million dollar low-income housing projects, some completed and others under construction, will eventually clear 10,000 families out of slum areas. New schools, hospitals, roads, bridges, dams and hydroelectric plants, going up all over the Commonwealth, are drastically changing the face of the island.

With this growth and expansion, so too has the Fire Service been experiencing its own "Operation Bootstrap" with early development actually going back to the hottest days of the Atlantic and Caribbean submarine warfare waged by the German navy. In 1943 vast tonnage was sent to the bottom of the ocean by German U-boats right at the door of Puerto Rico. Ships going from San Juan and coming into the port were frequently blasted out of the water by torpedoes. To protect Puerto Rico against incendiary warfare, created by possible bombings or shellings from off-shore subs, the government built a string of twenty fire stations ringing the island. This in effect was the real start of the present Fire Service of Puerto Rico, although the law creating it was approved by the Legislature in 1942.

Today nearly every city and town in Puerto Rico has at least one well-equipped fire station and, by the end of 1954, none of the 77 municipalities in Puerto Rico will be without one. The capital city of San Juan has six fire houses, with twelve companies and a fire boat to patrol the waterfront and bay. But it was not always like this in the new Commonwealth.

The first fire department in the Island was organized in the City of Ponce in 1853. Made up of volunteers, it is still in active service and had just celebrated its 100th anniversary.

Like almost every other country in the world, Puerto Rico went through the traditional stages in its fire fighting history. From the leather buckets stage it went to hand pumps and hose carts, before going into modern gasoline engines and aerial ladder trucks. During the second half of the nineteenth century and the first decades of the twentieth century, many small volunteer fire departments were sporadically organized throughout the Island, usually after the occurrence of a fire. But they lasted only while the people remembered the tragedy, and by the time a second fire struck a town, usually there was nothing left of the fire fighting equipment.

Up to 1943 nearly all Puerto Rican firemen were volunteers, with a great civic spirit but with little knowledge of the modern methods for fire fighting and fire prevention. Only the Capital of the Island had a group of paid firemen, which were changed with the changing political fortunes of one party or another. In this way, every firemanic group, organized from time to time in the various towns, operated as an independent unit, using different methods and equipment that made difficult help and cooperation between them.

With this background, it was natural for fire losses to be heavy and fire insurance rates accordingly high. It is not possible to estimate fire losses previous to 1942 because no records were

Class rooms at the Fire College are bright and airy, and well equipped. Here Chief Gándara is shown addressing a class of officers.

kept. At that time there were only 3 cities with fire stations, equipment and personnel, leaving 74 others powerless against the ravages of fires.

A new era began in 1942 with the establishment by the newly elected Legislature of the "Insular Fire Service of Puerto Rico," whose duties and responsibilities would cover the whole island with its 3,600 square miles and its 2,500,000 persons. In 1943, shortly after the inauguration of the Insular Fire Service, Raúl Gándara was appointed Chief, and still retains the post. For 16 years he had been a Captain in the Ponce Fire Department. Immediately after his appointment as Chief, he went to New York where he attended the Fire College of the City of New York. There he took the Officers' Course. To his credit is the only book on the subject of fire fighting ever written in Spanish, which is being used widely in all fire departments throughout Central and South America.

By the middle of 1944, Chief Gándara announced a policy aimed at the construction of at least one fully equipped fire station in each community, staffed by no less than four paid firemen. The first twenty stations had been constructed quickly in the vital coastal towns at the beginning of World War II, to protect them against fires from possible incendiary attack, in a cooperative effort between the Government of Puerto Rico, the Fire Service and Civilian Defense.

The job done to date by the Fire Service of Puerto Rico deserves mention if only to serve as an inspiring example of what a group of willing men, ably led, can do for its fellow citizens.

Fully supporting Chief Gándara's program, the Government, in 1946, appropriated $40,000 from which it expected that at least four new fire houses would be built. Gándara called a meeting of all the mayors in towns needing fire stations and asked for full cooperation and got even more than he had bargained for. The mayors agreed to provide, without cost, the sites for the fire stations. Frequently the municipalities' sanitation trucks could be seen collecting garbage and cleaning the streets in the morning, and hauling stone and sand from beaches and rivers in the afternoon or evening. Mechanics from the Fire Service's repair shop assisted in the operation of concrete mixers; some firemen helped hand-haul heavy concrete filled buckets, while others, under the supervision of the Department's inspectors, made electrical and plumbing installations. Still other firemen took care of the painting. And last, but not least, another group composed of mechanics and employees of the repair shop constructed fire trucks for the new fire stations. On new chassis, they mounted O. C. D. fire pumps—Chrysler Motor, Hale Centrifugal 500 G.P.M.—and the bodies were built around them and painted. Thus with heavy savings on labor, equipment and construction material, a total of nine complete fire stations were erected with the money allotted for only four. By 1948 a total of 39 towns had well-equipped fire stations and competent personnel.

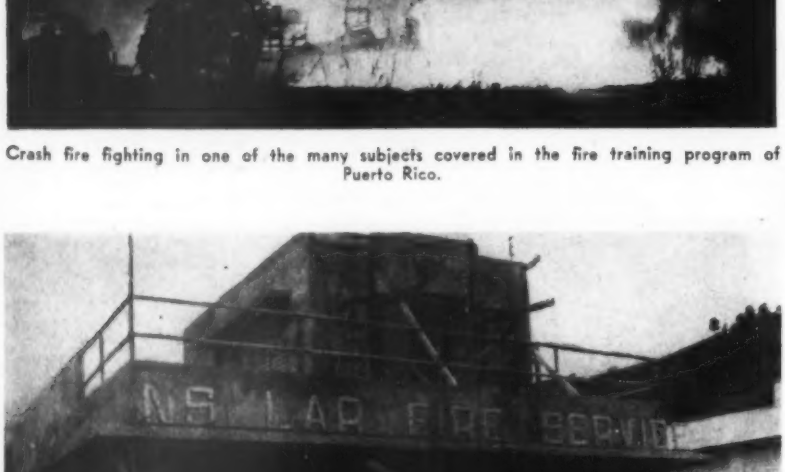
The story of the Fire Service of Puerto Rico is a continuous repetition of the efforts, struggles, and enthusiasm of its first years. In 1949 another appropriation—this time of $80,000—was made for the construction of eight new fire stations, but Chief Gándara insisted that

New fire station in San Juan being built by firemen.

Maguabo fire station.

Fire station at Ponce built by firemen.

Crash fire fighting in one of the many subjects covered in the fire training program of Puerto Rico.



Sometimes only one fireman can work because the rest are doing fire fighting or are in the fire college. This makes the work go slowly, but never stops it. Here one fireman is working in the construction of the Orocovis fire station.

Fire truck built in the repair shop of the Insular Fire Service by mechanics and firemen.

the words "or more" be added to the appropriation, based on the experience of the first grant. And it happened again! Twelve stations and eight new fire trucks were added to the Fire Service on money appropriated originally for "eight or more fire houses."

Fire drill at the Capitol Building. All firemen are thoroughly drilled in the operation of apparatus.

By 1951 this progress had reduced to 18 the number of towns lacking fire stations, as each new appropriation was so handled by Gándara and his men that far more than was expected was accomplished.

The Fire Service conducts virtually a perpetual fire prevention campaign, which has paid huge dividends in reducing fire losses. At least 1,600 buildings each year—particularly hotels, restaurants, night clubs, schools, theaters and gas stations—are inspected by the department to enforce compliance with regulations. Plans for new buildings and housing developments must be approved by the fire department and must be equipped with whatever safety devices the department deems necessary.

As a direct result of the extensive fire prevention campaign the great increase in fire fighting facilities and the thorough training programs carried on, the fire losses have diminished from year to year.

In 1945 the Fire Department requested a revision of fire insurance rates from the insurance companies. Because the Government had provided better fire protection, and thus the possibility of fires had lessened, it was logical to expect that fire rates should be lowered accordingly. Fortunately the efforts made by the Fire Department were so obvious that every office connected in any way with insurance (Office of the Superintendent of Insurance and the Office of the Actuarial Bureau) cooperated fully, and in 1945 came the first cut in premiums—a whopping drop of 32%.

In 1949, two separate decreases totalled another 5% and in 1950 another 8% was deducted in two additional cuts. The year 1951 began with good news for insurance buyers. A new reduction of 6% on some fire rates was announced on New Year's Day! Again early in 1952 a further-reduction of 10% became effective. The average fire rate reduc-

(*Continued on page* 887)

What Progress In "Wet" Water?

— A Symposium

ACCEPTANCE of surface tension reducers, or wetting agents, for controlling and extinguishing fires, has been slow but progressively persistent, according to a study just completed by this Journal.

Perhaps the most encouraging evidence produced by the study is the fact that although its full possibilities as an extinguishing agent or additive to water as the prime extinguishing agent have as yet been developed by only a limited number of large municipal departments, no record has been received of a department ever giving up wet water where it has conscientiously explored and tried out its full possibilities.

Its advantages in the extinguishment of deep seated fires, in baled goods, upholstery and other materials, are generally admitted and in many cases heartily applauded. But it is evident that many fire chiefs have not given wet water a comprehensive try-out. This is particularly true in: (a) determining the range and scope of wet water on not merely class A fires, but Class B fires; (b) determining the most efficient and economical methods of applying wetting agents (pre-mixed, and around-the-pump); (c) determining the actual facts about corrosive qualities of wetting agents, and other reported drawbacks.

Some of the objections advanced by those who have experimented to some degree with this product, as quoted herein, indicate a lack of knowledge of it as an extinguishing agent and of its limitations, and of the methods of using it. It will be noted from the statements of authorities who make fullest use of wetting agents that they have settled the doubtful issues of product limitations and application to their entire satisfaction.

Perhaps too much has been expected of this development. Perhaps the manufacturers, as well as insurance authorities and others interested in improved fire control, have failed to acquaint the fire service with the "facts of life" on the subject. At any rate, the following uncolored expressions from a widely representative selection of fire chiefs should help to bring the entire question of the uses and abuses of wetting agents into clearer focus.

Phil C. Piefer

Chief, Bakersfield Fire Department, Bakersfield, Calif.

Occasionally we use wet water in our booster tanks. Each piece of apparatus is equipped with a booster tank and carries a supply of wetting agent which can be added when greater penetration is desired. We do not use wetting agents in our pump-can extinguishers although we are using this type extinguisher on our apparatus.

Reviewing the advantages of wet water, they include (1) greater penetration of water; (2) less rekindling; (3) reduced amount of water necessary to extinguish and (4) overhaul time reduced, due to effectiveness of the wetting agent.

Where baled materials, such as cotton, hay, paper and rags are involved, we were able to extinguish with less water, greater penetration into the material and with less possibility of rekindle.

Yes, wetting agents have established their place in the fire service of the future. Improvement will come with more extensive use. The two more noticeable drawbacks are (1) necessity of rinsing tanks and hose after using a wetting agent because of the corrosive action; (2) containers leaking due to corrosion.

William Van Pfefferle

Chief, Camden Fire Department, Camden, N. J.

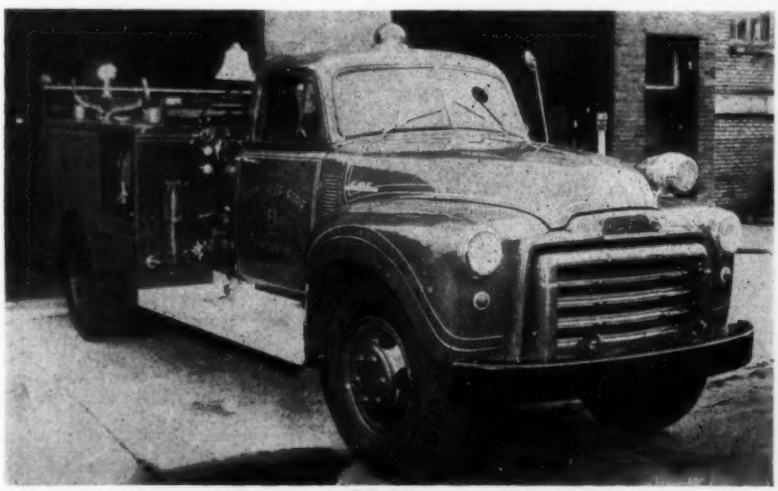
We have used a wetting agent for about one year, first on an experimental basis with a portable blending unit and for the past six month as a permanently mounted unit on hose and booster wagons built by our Municipal Motor Repair Shop as replacements for our hose and chemical wagons.

The wetting agent used is an emulsified capsule form with a ratio of 1000-to-one, and the blender is connected between the booster pump and the booster line in such a manner that the use of plain water or wet water is optional by the opening of the proper valve. Installation of a check valve in the blender outlet prevents water from entering the blender through the output while using plain water.

The accompanying photograph shows the blender mounted on the right or operating side of the apparatus.

We have found wetting agents very effective within the output limitations of our blenders, which is 40 GPM, on fires in homes, apartment houses, hotels and retail stores, where mattresses, upholstered furniture, either of innerspring or foam rubber construction, etc., were involved. All materials which formerly required practically complete destruction in order to extinguish deep-seated fires can be extinguished with considerably less damage through the use of wet water. Fires in files of dry goods, clothing, etc., can be extinguished more quickly and with much less loss, as the wetting agent used by us is non-corrosive and stainless.

Wet water, within the capacity available in the Fire Bureau at present, seems to be particularly effective on fires in bedrooms of homes, apartment houses and hotels where mattresses and clothing are involved and are emitting a large volume of smoke. The diffusive and penetrating qualities of wet water used with low pressure fog nozzles enable it to reach the seat of the fire,



Hose wagon in Camden, N. J., Fire Department, showing wet water blender mounted alongside hose outlets.

reduce the volume of smoke, and permit more efficient operation by the companies with minimum of water damage.

Wet water blenders will be standard equipment on all hose and booster wagons built in the future for the Camden Bureau of Fire, with the possibility in mind of manifolding blenders to supply 1½-in. and 2½-in. lines for special services in wetting-down operations covering a large area of baled or bagged material.

No trouble of any kind has been experienced with the blenders or wetting agent used by the Bureau.

C. M. Johnson

Chief, Knoxville Fire Department, Knoxville, Tenn.

Knoxville used "wet water" in its booster tanks for about a year; it was quite effective on small fires such as mattresses, beds, etc., where the liquid can penetrate the material. It is not effective on wood, etc. where the liquid cannot penetrate.

I do not believe wet water has established its place in the fire service. Since wet water was in the booster tank, we were forced to use it even when plain water would have been just as effective. It is more expensive than plain water.

George K. Marty

Captain, Burlington Fire Department, Burlington, Vt. (For Chief Donald J. Kelley)

We use wet water in our booster tanks and in hand pumps. The only deep-seated fires we have had the opportunity to use wetting agents on were heavy grass and brush fires. The agent has proved very effective on these, as we have been able to get to the base of such fires very quickly and we had very few re-kindles after using wet water. We do feel that wetting agents have established their place in the fire service of the future.

The only trouble we have had with wet water is that when stored in metal containers for any length of time, the containers become corroded and eventually leak.

J. H. Burke

Chief, Oakland Fire Department, Oakland, Calif.

Wetting agents have not been used in this Department to date because of the possibility of corrosion in the water tank. From observation at several tests which I have witnessed, wetting agents seem to have a definite place in the fire service. It is my intention to introduce its use in this Department in the near future.

Frank S. Sandeman

Chief, Long Beach Fire Department, Long Beach, Calif.

We use wetting agents in booster tanks and pump can extinguishers. They have performed well on deep-seated fires and were particularly effective on cotton bales, mattresses, rag fires, etc. I do believe this extinguishing agent has a place in the fire service of the future.

No troubles have been experienced where proper mixing measures were taken. To avoid possibility of corrosion in booster tanks, pump cans or piping, the wetting agent is added in time of need. A limited amount of wetting agent is carried on apparatus in containers, such as gallon cans, until needed.

Stephen Adley

Chief, Pittsburgh Fire Department, Pittsburgh, Pa.

We do not use wetting agents at the present time. In our tests we have observed that it has been effective in extinguishing deep-seated fires. We are in the experimental stage and have used wetting agents on mattresses, bales of waste and rags. They do have a definite value at present as well as the future.

A few years ago we encountered difficulties in the use of wetting agents in our booster tanks due to excessive corrosion. However, I am of the opinion, and have since been informed, that this condition has been corrected.

N. L. Wheeler

Chief, Division of Fire, Miami, Fla.

The fire which convinced us we were on the right track (in the use of wet water) was in a clothing store on Aug. 7, 1947, at 8:17 P.M. We had a 1% solution of wet water in Engine 5's booster tank and when they arrived at the fire the entire south side of the building was involved in fire, with severe smoke and heat throughout the building.

Engine 5 used their booster line with fog and wet water to extinguish the fire with 40 gallons of water. Engine 2 had laid a 2½-in. backup line but it was used only for the final overhaul. We found that convection currents had carried the fog particles a distance of almost 20 feet horizontally and extinguished fire in some woolen suits along the north wall.

We have since had many larger and more impressive fires which were controlled with wet water and fog, but this one was the clincher for us, and Chemical 5 was put into service on July 1, 1948, carrying 535 gallons of pre-mixed wet water and two pre-connected 1½-in. lines.

On the basis of results we have obtained from the use of wet water on many types of fires over the last six years, we are very enthusiastic about it, and are delighted to avail ourselves of the opportunity to answer your questions.

First, prior to the development in our Shop of the "Miami Proportioner" we used wetting agent in all booster tanks in the high value and residential districts, omitting it from the tanks of those units which respond primarily to grass and rubbish fires. We still use it in the pump cans on all units, and the proportioner enables us to use either plain or treated water through preconnected lines on all our pumping units.

Our experience with test fires, as well as building fires, has led us to the following conviction: When applied in the form of low-velocity fog, wet water as compared with plain water, results in

a—Faster extinguishment with less water.

b—Better penetration and, consequently, less run-off.

c—No rekindles. During the six years we have used wetting agents, no building fire extinguished with wet water has rekindled.

d—Less water damage, due to the better penetration and use of less water.

e—Easier and more complete overhaul and property cleanup.

Our tactical experience has been almost exclusively with fires involving wood, wood products, textiles and materials of similar nature. We have found fog and wet water particularly effective on fires involving large wooden tenements, "tax-payers," etc. In every instance where the pre-connected 1½-in. lines, using fog and wet water, have been able to advance to the area of involvement, control and extinguishment have been effected. In test fires, we have used it with high degree of success on flammable liquid fires in open tanks. We have had no occasion, as yet, to try it on fires involving flammable metals.

Our experience has convinced us that wetting agents have incontrovertibly established their place in the fire service, and it is my personal conviction that further research and experimentation will develop even broader applications for them in the fire service of the future.

The only trouble, if any, we have encountered in its use is where brass in the open air is exposed to the wetting agent or its solutions; it will tarnish excessively unless cleaned shortly after exposure.

John C. Long

Chief, Danville Fire Department, Danville, Va.

We use wetting agent in our booster tanks, also in our hand extinguishers. We also put it in all soda acid extinguishers that we recharge for our hotels. We have never found anything that will extinguish a deep-seated fire in cotton mattresses as wet water will. Wet water is the only thing that we have found that you can really put out a cotton fire with, and we have lots of them.

We have had lots of cotton fires that we have used wetting agent on; on one fire we had 350,000 lbs. of cotton on fire and plain water would not have any effect on it. When we went into this warehouse, the plant fire department had 30 2½-in. lines on this fire. I had the lines cut off, and we put this fire out using one 1½-in. line with wet water.

Yes, wetting agents have a definite place in the fire service on some fires. And I believe that any fire department that does not use wet water today is behind the times. We have never experienced any bad effect from the use of wetting agent; we have reports showing that the salvage loss is not near as much from using wetting agent as it is from the use of plain water.

Sidney L. Ulrich

Chief, Peoria Fire Department, Peoria, Ill.

Under certain conditions we add wetting agents to our booster tanks and hand pumps when the occasion requires. I feel that it is a definite aid in extinguishing certain types of fire of a deep-seated nature.

One particular case was a fire in a coal mine; a wetting agent was used to definite advantage and the fire was extinguished surprisingly quick, and I believe it worked itself back into the coal vein where the burning was beyond the reach of normal water application. Another case was where certain types of finishing materials were being sprayed on, and this material when ignited, caused a coating to form over the burn-

(*Continued on page* 854)

Germany's experience during World War II provides useful data on

Wartime Fire Defenses

By KURT LENTZ, Dipl. Ing.,
Bremen, Germany

Is our modern fire service sufficiently prepared for World War III? This question has often been raised during the past few years in this journal. Various authors have approached this question from different viewpoints, but they all agreed that, in a future war, aerial warfare will again play an important role. There is no doubt whatsoever that fire will again be used as a weapon. Therefore fire fighting will have to play a major part in civil defense. The experienced German fire fighters of World War II are now watching with great interest the civil defense measures of other countries. They hear of new equipment, read about new training practices and large scale tests. Then they ask themselves the question: How will the cities of America and other countries look at the end of World War III? Will they be in the same ruined condition as ours here in Germany? Couldn't we possibly prevent this?

World War II taught many hard lessons to the German fire fighters. In the beginning of the war, there was practically no bombing of large cities. When the air raids started during the summer of the year 1940, they were mostly aimed at industrial objects and not at the downtown parts or the residential districts. Gradually they not only grew in strength but they also destroyed the densely populated parts of the cities, blasting the large apartment blocks and finishing the destruction by fire. This resulted in conflagrations of a size never heretofore witnessed by any fire department. These fires were not only of an unusual size but they were also breaking out in such huge numbers that the fire fighters were confronted with problems which were absolutely new and practically unforeseen.

Despite considerable improvements in techniques of fire fighting it was quite impossible to cope successfully with the staggering demands of these fires. During the war such immense quantities of fire fighting equipment were produced that the figures now published by the civil defense services in other countries appear puny and insignificant. In Germany, the production of hose alone was increased more then eleven times in spite of the fact that fibers and rubber were extremely scarce. Special fire fighting communications came into existence. Individually independent special water reservoirs were built in all parts of the cities and towns all over the country. All available men regardless of age (towards the end of the war even the women) were trained as auxiliary fire fighters. It was all in vain!

In a future war, even as in the past, an enemy air force, regardless of its strength, will be able to concentrate all its power on any one chosen point where the defender is always forced to spread his equipment and men all over the country. Weapons of the future war, such as pilotless airplanes, guided missiles, jet propelled projectiles, and atomic bombs will increase the seriousness of this situation. The fire fighters therefore always will have a stupendous task facing them.

To prepare for a war, one must find out as far as possible what kind of weapons are at the disposal of the enemies. Military authorities always try to keep the development of new weapons secret. Popular periodicals on the other hand bring sensational reports about the newest development of war potential.

The men of the civil defense must not permit themselves to become confused. Undoubtedly nuclear radiation will handicap fire fighting in the next war. The experience of the last two wars shows that technical developments of the offense will ultimately be mastered by the defense.

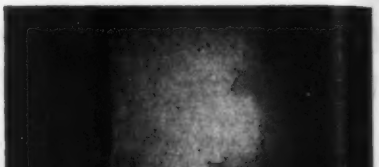
Our task will be to overcome the incendiary effects of aerial attacks, whether they are caused by atomic, napalm, phosphor or any other bombs. We shall have to deal with large area fires and the resulting fire storms. Besides large numbers of fire storms we shall have to cope with innumerable smaller fires, each of which may assume a dangerous size at any time.

The relationship between the fire storm and the smaller individual fires in the surrounding zone, which have not yet combined to a new fire storm, was described by the author in the March,

A suburb of Bremen, Germany, after fire storm.

This is where firemen have to advance. Who knows what there is behind?

Water is too precious for this!



Downtown street after an aerial attack. Fires are roaring at innumerable places. Small fire fighting forces are at hand. Water must be pumped from far away. It will be the task of mutual aid forces to control this blaze.

1951 issue of FIRE ENGINEERING. Since that time, numerous large scale tests have been made. According to the reports of civil defense organizations, very considerable numbers of men and machinery and very much modern equipment were involved. Useful as these tests are, they may give both the participants and the onlookers a false sense of security. The article of Roi B. Woolley (February 1953 issue of FIRE ENGINEERING) should be taken as a warning that our fire fighting still lacks a sound method of command for war conditions. It is the most dangerous mistake to compare the war and peacetime fire fighting conditions by simple multiplication. Wartime fires not only create much higher technical demands, they also present entirely different conditions; and the leadership must deal with entirely new and unusual problems.

Information

An exact knowledge of the situation is absolutely necessary to enable the commander to make an intelligent size-up. In peacetime, he surveys the fire himself and to the knowledge thus gained he adds the information supplied by his subordinates. But even then it often takes considerable time to get a true picture of the situation. Even the various materials on which the fire is feeding are often not known. Despite this fact, his knowledge of the situation is sufficient to enable him to direct the proper attack.

In peacetime it is the custom of the fire departments to keep their headquarters informed by making regular reports regarding their activities and progress. Headquarters thus receives a picture of the fire, and such knowledge serves as basis for dispatching and deploying available fire fighting equipment. In the case of simultaneous fires, apparatus can therefore be distributed to the best advantage. At this place it is important to note that in the case of large fires, the number of such reports increase very considerably.

An air raid produces a great number of simultaneous fires. They are often very close together in some parts of the city while in other areas they are far apart; in still other sections whole rows of houses go up in flames. The first action is up to the home defense which has trained its people in fire fighting, yet these men and women lack the practical experience of the professionals. In most cases, however, they are qualified and equipped well enough to cope with the small initial fires. Therefore the fire department is not engaged with these fires but stands ready to take over where the need arises. The effect of the home defense depends upon the speed of its initial action. In the beginning of the war, the German Home Defense used to be right on the spot immediately after a bomb had fallen, often controlling these missiles before they had ignited any parts of the house. Later on, the bomb raids increased in severity to a point where everybody had to remain in the shelters during the whole length of the attack. Sometimes an hour or more elapsed from the falling of the first incendiaries to the time that the first fire fighting action could be taken.

The alarms became very numerous and were mostly for fires of a much greater size. The communication system was usually put out of action. The calls were further delayed. When they did come in, the receiving centers were practically deluged. In Germany the district police stations were used as receiving centers for fire calls and the policemen were pressed into service to make the intial investigation.

Fifty or more calls sometimes piled up in one police station and had to be passed to headquarters. Even where the telephone communication still functioned after a raid, it was completely useless because innumerable simultaneous calls blocked the remaining lines right after an incendiary raid. Exclusive, direct means of communications are required to pass on the information collected at the receiving centers.

The man compiling the calls in the receiving center knows his territory and hears the full report. He has therefore a clear picture of the situation. He can not possibly pass on all the details nor can the man at headquarters have his extensive knowledge of the locality. Therefore the picture in headquarters is much less clear. It is not much more than a list of streets and house numbers.

The multiple commander is confronted with the following difficulties:

1. In the beginning the calls trickle in slowly. Later on he is practically deluged. It would be a serious mistake to give too much assistence to the early bird and loudest voice at the expense of those who come later, and much more meekly, but might have far more serious fire to fight. The German Home Defense often succeeded for ten or more hours to contain the fire in a limited space only to lose out when the water supply was exhausted. Relief forces were often required as late as twelve or more hours after the initial attack.

2. The reports coming to headquarters took considerable time to transmit and were often anything but up-to-date. Usually the situation has become worse in the meantime.

3. The reports were given by people possessing certain qualifications but lacking practical experience. All information regarding possible danger as well as the extent of the fire, which is mostly hidden by smoke and heat, are more or less unreliable. In "sizing up," the commander must expect exaggerations of the danger.

The commanding officer must bring order out of the confusion of the innumerable reports pouring in simultaneously from all over. He most respond to the quickly changing situation and get and retain a clear picture of the actual danger to his city in order to place the right amount of men and equipment at the right place and, at the right time, to call for outside help.

Professional fire fighters often blamed the very long delay in getting a true picture of the situation on the fact that the reports were received and the first investigations were made by members of the police force and not of the fire brigade. They claimed that the policemen lacked the necessary training and

that only professional fire fighters ought to be used for the initial investigations. In this they may be mistaken. The advantage gained by having more accurate reports is more than offset by the resulting lack of trained fire fighters for actual duty. Besides, these better reports cannot possibly be transmitted in full detail by the receiving centers under actual war conditions. Other fire chiefs blamed the lack of communications. They forget the fact, that all reports are aimed at one person; the commander-in-chief. We must visualize a number of lists each containing reports of as much as 50 fires or more. The man in charge never gets sufficient time to peruse these lists carefully.

To enable the multiple commander to get a more or less true picture of the situation, he needs a special plan of his territory, giving him all necessary details regarding the size and kind of buildings, the materials involved, all the various details which may prove helpful, or a hindrance, and last but not least, the available sources of water.

Such a map should be fastened to the table in the center of the control room. It is the task of the subordinates in the headquarters to mark all buildings known to be burning with red, regardless of the size of the fire. Besides the red marking, the aides will have to indicate (with another color) the time when the report was received. All available information regarding debris handicaping traffic should also be marked. The map of the city will then show areas where the red dots are very closely spaced and others where they are far apart, while in still other areas the red dots already begin to join and form a large splotch. The reddest areas represent the chief target of the aerial attack. Here even the individual fires tend to be most serious and the danger of a fire storm is especially acute. Regardless of the accuracy and the number of the reports received, such maps proved the most effective help during the incendiary attacks of the last war, because they indicated right from the beginning the centers of danger.

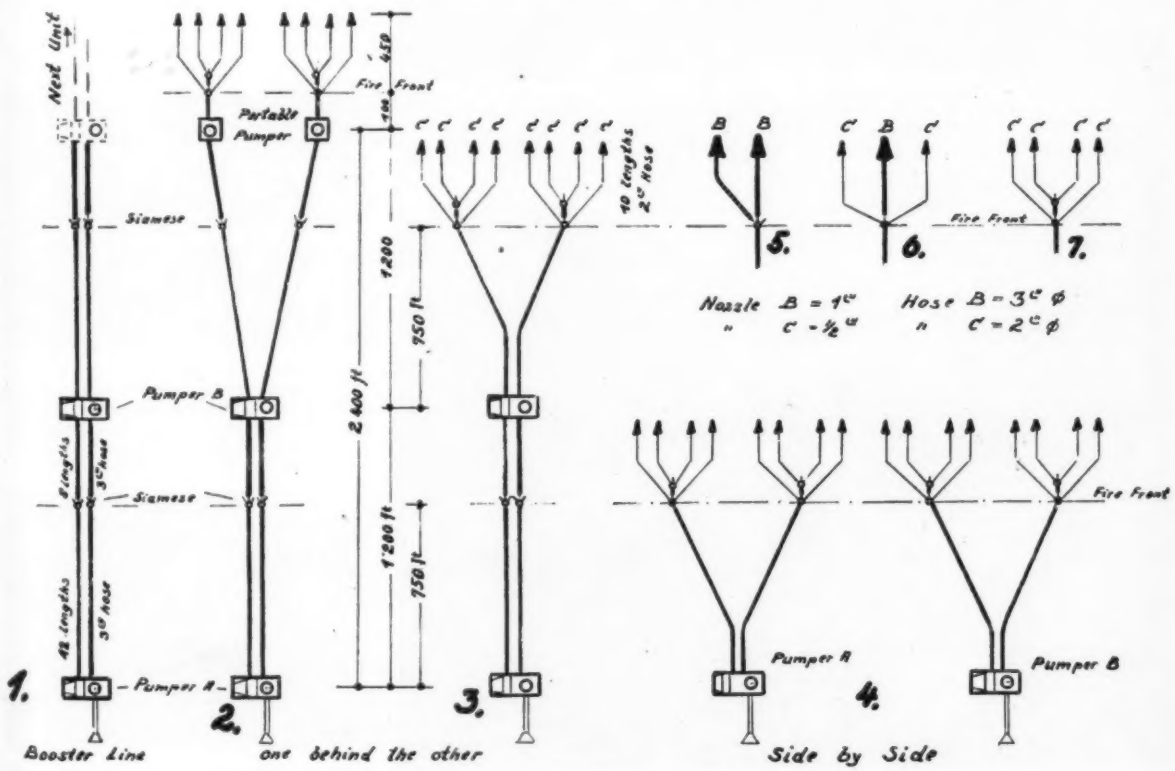
As soon as the chief danger points are recognized, the available forces can be sent into action. It can be just as serious a mistake to decide too hastily as to delay too long. As soon as the professional firemen take over, headquarters will get a more and more accurate picture of the situation. In sending out his companies, the multiple commander must consider the routes very carefully, because immediately after an air attack many streets will be blocked. As soon as the multiple commander has reason to assume that he knows the true situation, he will begin to draw upon the mutual aid facilities in accordance with previously prepared plans. Until these mutual aid companies arrive, a certain time is bound to elapse and there is practically nothing to do for the commander at headquarters. Now is the time for a successful commander-in-chief to take his jeep (he must be able to drive over piles of debris!) and go on a tour of reconnaissance. He may keep in touch with headquarters by radio; but his chief task is to see, and to "size up." Upon his return to headquarters he can coordinate the information thus personally gained with the report accumulated at headquarters in the meantime. His map will then give him the basis for directing the available forces most efficiently.

Deployment of the Fire Fighting Forces

As stated in the beginning, the mutual aid forces will play the important part in fire fighting. The demands made upon the local forces will by far exceed their powers, at least in the beginning. Their leaders are free in their decisions and, if they are capable, they can work successfully without regard to neighboring forces. It is quite different with the great number of companies coming from outside. They arrive at a check point at the city limits to get their orders.

It seems to be a simple matter to send one company to each building known to be involved. This was the usual practice in Germany in the beginning. But very soon difficulties developed. The information available at headquarters was not sufficient to give each force a task to which it was adequate. Sometimes the fires could be put out in a very short time, due to the efficient help of home defense. But often the fire was far beyond their forces and their struggle was hopeless; or the fire was so far advanced that there was no sense in trying to put it out. Water, manpower and machines were too scarce, and any number of worthwhile tasks were near at hand. Many companies, especially those under a commander who was gifted with a lot of common sense, acted on their own, fighting fires where they found them. When other companies

(*Continued on page* 852)



Basic Forms of Deployment.

Water Cisterns Provide Farm Fire Protection

Enable the Rural Fire District Department to do Effective Work*

FIRE strikes somebody's farm every fifteen minutes. Within a 24-hour period it will visit 100 farm families, leave nine farm people dead and destroy a quarter of a million dollars worth of property.† And this goes on every day.

To halt these losses, many farmers have banded together to form fire protection districts. But organized fire fighters need water quickly and in abundant supply. According to fire protection district records, from 2,000 to 3,000 gallons of water is a reasonably safe quantity to keep in reserve for fire fighting on the farm, but this amount is seldom available unless special storage tanks are provided.

An underground concrete fire cistern will store this water economically and efficiently. It can be placed conveniently near the farm building group, and when it is kept filled it is valuable insurance when fire strikes. It is so valuable, in fact, that many insurance companies give a credit in rates if 3,000 gallons of water is kept available at all times for fire use.

The tank is covered with earth and sodded. The exposed riser in left foreground shows that this farm has a ready supply of water when needed.

Rural fire departments can be far more efficient at extinguishing a costly blaze on the farm if fire equipment has easy access to a riser such as this one (in foreground) which connects with a 3000-gallon underground fire cistern.

Building the Cistern

To determine the best location for the concrete cistern the farmstead layout should first be studied. The site chosen should be within 700 feet of the building group but not nearer than 100 feet to any building. A distance greater than 100 feet from large buildings is desirable to give the fire truck room to operate. A place that can be reached easily by the fire truck in all kinds of weather should be chosen. If reduction in insurance rates is expected, the recommendations of the insurance company should be checked before building is begun.

The plan described is for a square cistern with inside dimensions 11 x 11 x 4 feet deep. Maximum capacity is 3,630 gallons. Concrete side walls are 6 inches thick and are reinforced with wire mesh and steel bars. The cisten top is precast and is set in position after the concrete in the tank has hardened. Methods of construction are illustrated by photographs.

The location of the hole to be dug is marked out in much the same manner as for footings in buildings. Stakes or batter boards are set at the corners and strings are stretched to mark the boundaries of the excavation. Where the earth is used as the outside form, the finished hole must be exactly 12 feet square. Power equipment can be efficiently used in digging this size hole. If it is used, the hole should be dug slightly smaller than its final size. Any irregularities can then be smoothed out with a shovel. A plank frame is laid around the hole to serve as a guide for the final hand trimming and also to protect the edges of the bank against crumbling.

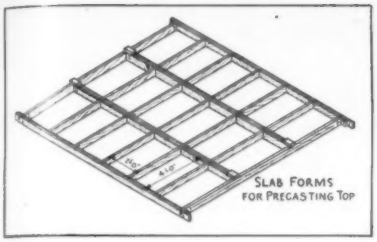
The total depth of the hole should be 5 feet 10 inches if the finished grade over the cistern is to be level with the undisturbed earth. This allows for 1 foot of earth over the cistern lid.

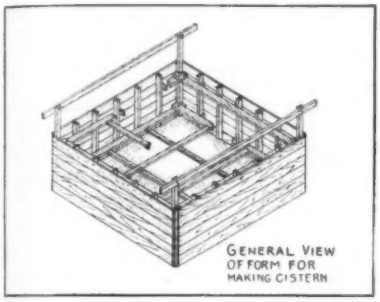
Forming the Tank

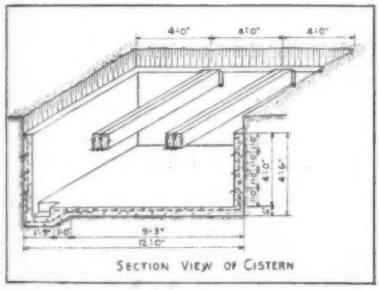
This form is made in sections and can be transported easily from place to place. Farmers in a community often share the cost and use of forms.

*Acknowledgement: From a bulletin entitled "Fight Farm Fires; Build a Concrete Fire Cistern," published by the Portland Cement Association, 33 W. Grand Ave., Chicago 10, Ill. The bulletin contains many construction details not included in this article. Copies of the complete bulletin may be secured from the Association at the above address.

†Based on estimates from a report of the Subcommittee on Fire Loss Statistics, Farm Fire Protection Committee of the National Fire Protection Association, and issued through U. S. Department of Agriculture, Bureau of Agricultural Economics.







The form shown is for use when concrete is cast directly against the earth with no outside wood forms. If the soil will not stand in a vertical position without crumbling, a larger excavation and outside lumber forms are also required.

The tank form consists of these pieces: four wall panels, eight 2 x 6-inch wales, two 2 x 4-inch carriers and eight cross braces. Four of the cross braces are built of two 2 x 4's spiked together in a T-shape; the other four braces are single 2 x 4's.

The wall form is assembled by bolting the four panels together to form a box. Square-headed bolts are put through matched holes from the inside and nuts are tightened on the outside. The forms are then coated with a light oil. Braces and wales are not put in place until after the form is dropped into the hole. The form may be brought to the correct level by blocking up beneath the 2 x 4-inch carriers resting on the plank frame around the hole.

Reinforcement

The reinforcing steel for the tank is assmbled around the form before it is set in the hole. The 6 x 6-inch No. 6 gage welded wire mesh for the floor slab is slipped beneath the form and bent up on all four sides so that it will lap the side wall reinforcement by 6 inches. If the bottom mesh is made up of a series of strips, the strips should overlap each other at least 6 inches. Each strip will need to be 12 feet long. Two layers of 6 x 6-inch No. 10 gage mesh may be used if 6 x 6-inch No. 6 is not available.

A 4-foot wide strip of 6 x 6-inch No. 10 gage mesh 47 feet long is next cut off and stretched around the perimeter of the forms. The ends should be lapped and wired together. Also the bottom mesh should be wired to the side wall reinforcement. Spacers to hold the mesh 3 inches away from the form are set in position. These are removed later as concreting proceeds.

Three ½-inch round bars are placed continuously around the form, completing the steel assembly. These bars are spaced 1 foot apart and are wired to the mesh.

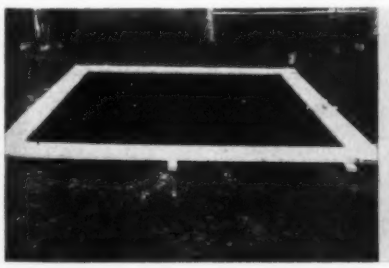
Placing Concrete

A mushy, workable mix should be used for the tank. A thin, soupy mix will not produce a watertight concrete and is objectionable because it will flow out beneath the wall forms.

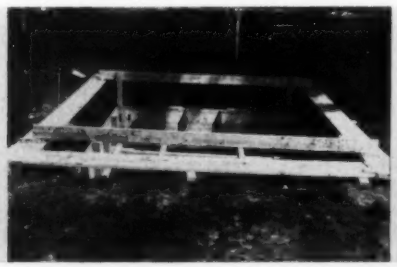
Concrete should be placed in a continuous operation if possible to avoid construction joints. A layer about 1 foot deep should first be placed in the forms the whole way around the tank wall. This layer should be spaded thoroughly so that it is worked well into and around the corner at the floor. Then the 6-inch thick floor is placed. The reinforcing mesh in the floor should be lifted occasionally to keep it from being pushed to the bottom by the weight of the concrete.

Concrete in the walls should be placed in horizontal layers about 6 inches deep and kept at a uniform level the whole way around the form. This prevents uneven pressures and keeps the forms from sliding. Layers are built up by dumping concrete at various locations around the form. Concrete should not be placed in large quantities at one point and then worked for long distances in the form.

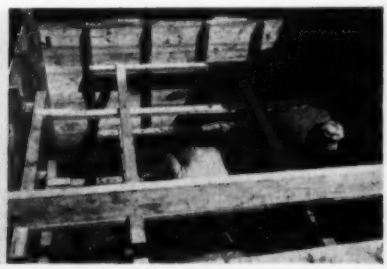
Thorough spading along the surface of the forms and around the reinforcing steel is very important. This spading helps to make a dense, smooth, watertight wall free from rock pockets



A plank frame serves as a guide for squaring the hole and prevents the edges from crumbling. Reusable forms for the tank are then assembled above ground and reinforcing steel is attached.



The complete unit is set in the hole and leveled by blocking up under the carriers.



Concrete of mushy consistency is worked well around the reinforcement in the 6-inch thick floor slab.

Concrete is spaded into the wall forms in layers 6 inches deep. When the forms are filled, the top surface is struck off with a woodfloat.

Removal of forms after 2 to 3 days reveals the dense, watertight concrete walls. Note the joist seats in the wall at left and right.

Reusable forms for precast joists and lid slabs may be set up on any level surface. Reinforcing steel is cut to fit before concreting begins.

and honeycombing. The inside of the form should also be tapped with a heavy hammer or sledge at frequent intervals to release air bubbles which may be trapped in the concrete next to the forms.

When the wall form is completely filled, the top is struck off level with a woodfloat and the concrete is left to harden. Forms should not be removed for two to three days after casting. The forms are stripped by removing the cross braces and wales, then loosening and removing the bolts at each corner. Excessive prying against corners of the concrete wall should be avoided.

Making Joists and Lids

Concrete joists and lid slabs may be precast on any convenient level surface. The concrete floor of a building or level bed of sand is satisfactory. If a concrete floor is used, building paper, oil, or some other bond-breaker must be used to prevent the fresh concrete from adhering to the floor.

Four joists 5½ inches wide, 9½ inches deep and 11 feet 6 inches long are required. Each joist is reinforced with two ⅝-inch round bars near the bottom and one ½-inch round bar near the top. These bars are each 11 feet 4 inches long. A 1½-inch layer of concrete is put in the bottom of the joist, then the two ⅝-inch round bars are laid in. Concrete placing continues until the surface is within 1¾ inches of the top of the form. At this level the ½-inch round bar is laid in. Then the form is filled and the concrete is struck off level.

Joist forms consist of 2 x 10-inch outside forms and 1 x 10-inch dividers. Braces across the forms at the third points hold the dividers from bending while the concrete is being placed. The forms are held tightly together with a bolt or twisted No. 9 wire at each end.

Eighteen precast lid sections are needed. These are 3⅝ inches thick, 1 foot 11¼ inches wide and 4 feet long. The odd dimensions result from the use of finished lumber for forming. Each lid slab is reinforced with a 22-inch wide strip of 5 x 6-inch No. 6 gage mesh. After a ¾-inch layer of concrete has been placed in the bottom of the form, the strip of mesh is laid in and the form is filled with concrete. Two of the sections are constructed with 10-inch drain tile risers built into them. A double layer of mesh should be used in the sections which have the risers. One of the tile risers is to receive the suction hose of the fire truck. The other riser is for emergency use in case of a large fire where more than the 3,000-gallon supply of water is needed. Water can then be emptied into the tank through one riser at the same time that the suction hose of the fire truck is withdrawing water from the other riser.

Joist forms assembled and ready to receive concrete and reinforcing steel. Each joist requires two ⅝-inch round bars near the bottom and one ½-inch round bar near the top.

Forming the lid slabs consists of 2 x 4-inch perimeter forms and 1 x 4-inch divider strips. Slots to receive the dividers are made by nailing pieces of 1 x 4-inch to the 2 x 4-inch forms.

The lids and joists should not be moved for at least five days after placing. During this time they should be kept continually moist. This may be accomplished by covering them with wet burlap or wet straw. Fresh concrete should be protected from freezing in cold weather.

The joists are hauled from the casting site to the tank, then set and mortared in position in the seats of the tank wall. Two joists are placed at each location. Farm tractors can handle these units easily with the hydraulic lift or the manure loader. Each joist weighs about 625 pounds; each lid about 350 pounds.

Mortar (1:3 mix) is spread on the joist top and on the tank wall, then the lids are set on. Backfilling should be done gradually to avoid impact of earth on the lid.

Watertight Concrete

If reasonable care is taken in mixing and placing concrete the fire cistern should require no coating to make it watertight. A recommended concrete mix for this cistern is: 1 part portland cement, 2¼ parts sand, and three parts gravel or crushed stone. Not more than 5 gallons of water for each sack of cement should be used if the sand is in an average moist condition. If the first batch mixed according to these proportions does not have the workability desired, the amount of aggregate may be adjusted to obtain desired workability in succeeeding batches. The proportion of water to cement should not be changed. Concrete should be mushy and workable but not soupy.

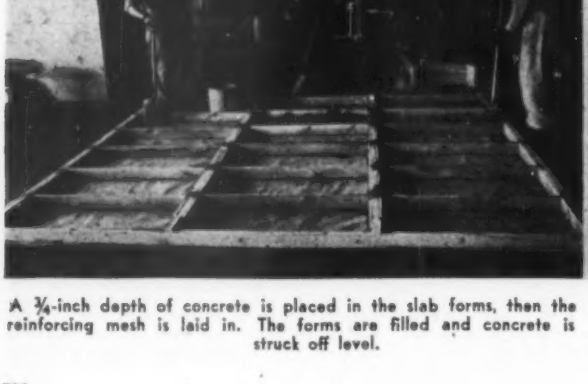
Portland cement should be free of lumps that cannot be pulverized in the hand. Water should be clean—drinking water is usually satisfactory. Sand should be clean, hard, durable and well graded with all sized particles ranging from a very fine up to ½-inch. Gravel or crushed rock should range in size from ¼-inch to 1½-inch. Particles larger than 1½ inches should not be used.

Civil Service for Pennsylvania Firemen

Answering a question from one of our readers, an act was passed in Pennsylvania providing for the establishment and extension of civil service to fire department personnel, several years ago.

In boroughs, towns and townships of the first class where there are three or more paid fire fighters and where no civil service commission existed at the time, the civil service system was to be established. For those boroughs, towns and townships which established a civil service system in 1941 for police personnel, civil service was to be extended to the fire departments which employ two or more fire fighters.

Those localities with a civil service commission may utilize it in carrying out this legislation rather than appoint a new commission. Three commissioners were to be appointed to administer the act where no civil service system existed at the time.



A ¾-inch depth of concrete is placed in the slab forms, then the reinforcing mesh is laid in. The forms are filled and concrete is struck off level.

Joints and lid slabs can be set on the tank after they have been moist-cured for at least five days. Lifting hooks should be placed in at least one slab in case emergency removal is necessary.

Controlling Hazards of Materials in Transport

A Symposium

THIS nation is the world's largest user of flammable liquids and explosives. There is hardly a community of any size in the country in which there are not storages of gasoline, oil or other fast burning liquids, and whose streets and thoroughfares are used by tank trucks and other vehicles for transporting those liquids. Even the speedways and turnpikes must have their fuel service stations and must be traveled by the fuel supply vehicles.

By virtue of this fact, together with the increasing traffic of all kinds on all the nation's thoroughfares, the incidence of fire involving these transports shows a steady upcurve, notwithstanding all the efforts of fire protection and safety engineers to prevent it. There is hardly a city or town or village that has not had a fire of some sort involving the handling, storage or transportation of flammable liquids or explosives. Or, if local fire fighters have not had to fight such a fire locally, they have more than likely been called to help some less fortunate neighbor.

Thus, the prevention of fires in this category should be the concern of all firemen everywhere, just as it is of the International Association of Fire Chiefs, the National Board of Fire Underwriters, the National Fire Protection Association, the Petroleum Institute and all the other groups concerned with making, storing and moving these essential, but dangerous products.

FIRE ENGINEERING has in the past published many reports of serious and fatal fires involving transportation of flammable liquids and explosives. It has attempted to acquaint its readers with the measures that are being taken to prevent such incidents, and to cope with them when and if they do occur. All such studies, as well as the symposium which follows, point up the need of still more research; still more sane and sensible regulatory measures—and enforcement of existing measures, and more cooperation between those who produce, store and distribute these products and those of the fire service charged with the responsibility of protecting life and property against fire and explosion which is bound to occur, somewhere, even with all the laws and regulations and best intentions in the world.

Therefore, to bring our readers still further up to date, and to provide helpful information for the Symposium on minimizing the hazards incidental to the transportation of flammables, explosives and other dangerous materials over highways and city streets, we asked a large and representative group of fire chiefs, from all parts of the country, to give us their experiences and ideas on four most pertinent topics. They have done so in considerable detail.

The response was so gratifying, and so illuminating, that it is planned to continue publication of the individual reports in subsequent issues of this Journal.

Briefly, the questions had to do with (1) the control exercised by the fire department over the movement of trucks carrying these flammables and other dangerous materials over the city streets; (2) and relating to No. 1—what limits on the movement are found in the communities of respondents; (3) have Chiefs experienced fires involving these flammables in recent years, and (4) what recommendations do Chiefs have to offer to meet the problem of transporting these hazardous products over our highways and byways.

Frank H. Burns
Chief, Fire Department
Grand Rapids, Mich.

When a multiple-wheel gasoline tanker and trailer, loaded with 18,000 gallons of high octane gasoline, collided with a gravel truck near Grand Rapids, Mich., recently, the driver of the tanker received burns from which he died a day later, and fire fighters from Grand Rapids, the Kent County Airport and Grand Rapids and Wyoming Townships learned first hand about the perils of transporting flammable liquids over the highways.

Following the crash, the gasoline vapors ignited, trapping the driver of the tanker. He was able to free himself, but received fatal burns. The driver of the gravel truck was injured less seriously.

Flowing burning gasoline from the ruptured tanker entered the sewer system from the highway, popping manhole

Photo Courtesy Grand Rapids Herald

Grand Rapids tanker fire following collision with gravel truck.

Photos Courtesy Grand Rapids Herald

Top: Fire is brought under control with foam streams. Bottom: Mopping up with carbon dioxide.

covers over a quarter-mile radius. One unidentified woman was knocked down by a manhole blast and several motorists were endangered as the covers flew into the air. Firemen quickly controlled the subterranean fires, however, and no property damage resulted.

Pumper No. 10 and a foam and other units from Grand Rapids were rushed to the scene, with Deputy Chief Ernest Esbaugh and District Chief George Slocum. A three-ton Cardox CO_2 unit and a small Jeep crash truck equipped with Ansul dry chemical, were dispatched from the Kent Airport and did excellent work in bringing the fire under control. Water fog and straight streams were also used by the eight township units to keep the blazing tanker cool and prevent a more serious disaster.

The fire again focussed attention on stiffer truck laws to compel trucks hauling such flammables to follow predetermined safe highway routes. A proposed ordinance to clarify routes which trucks must follow had its second and third readings by the Grand Rapids city commission and is expected to be adopted. The proposed ordinance requires all trucks, even those originating and terminating their routes in the city, to travel truck routes. The present ordinance exempts local trucks from following truck routes.

This incident also illustrated another factor in such highway fires. That is the possible serious loss to communications resulting from burning of poles and overhead wires. In this fire extensive damage was done to power and telephone lines. Fortunately, there were no houses within 250 feet of the crash and fire, but fire fighters had to work fast to prevent involvement of the Shell Service Station 150 feet away. Although its signs were blistered, it was saved.

The City of Grand Rapids regulates the flow of traffic through the city by ordinance. The length of the truck is regulated, a license to operate is required and inspection of the trucks by an approved garage is mandatory.

All through traffic must travel designated streets. Traffic that can be is routed to the outskirts and around the city.

In the last few years, we have had one major tank wagon fire, besides that described above, and three others that had all the potentials of a major disaster. The major fire resulted from faulty brakes as the tank wagon was coming down a curved hill approaching the city. The truck turned over, pinning the driver in the cab and burned him to death. The entire 8,000 gallons of gasoline spilled into the sewer or ignited, filling the entire west side sewers full of gasolines fumes. At the scene, six houses were burned extensively from the fire that resulted. Two days after the fire, a worker at the sewage disposal plant turned on an old fashioned arcing switch and the fumes were ignited, killing the man and blowing up one section of the plant.

The opinion of the writer is that all tank trucks must be banned from high value districts as far as possible, and that definite routes be established; more rigid inspections of the mechanism of the vehicles; and at least one 15-pound dry powder extinguisher to be placed on all vehicles.

John H. Alderson
Chief Eigineer, Department of Fire
Los Angeles, California

Our Dangerous Chemicals Code amply covers the problem of control of trucks through our City. Chapter I, Div. X of that code restricts the transportation of Dangerous Chemicals in excess of the following amounts in Fire District I without special permit from the Chief:

Hydrocyanic Acid	50 lbs.
Flammable gases	300 lbs.
Solids which are spontaneously flammable by contact with air, friction, heat or moisture	100 lbs.
Explosive materials	10 lbs.
Spontaneously flammable liquids	50 gal.
Water-reactive flammable liquids	550 gal.

Any reportable amounts of dangerous chemicals may not be hauled through tunnels in the City. In addition, every tank truck hauling flammable liquids through this City is required to be inspected and obtain a permit from this Department annually.

We limit the movements of Class A and B explosives to one route through Los Angeles and have devised a convoy setup to escort these explosive-laden trucks over this route. The route prescribed is as follows: San Fernando Road to Avenue 26; Avenue 26 to Daly; Daly to Mission; Mission to Santa Ana Freeway and thence out of town. You might be interested to know that a group of some 19 common carrier truck lines, all of whom are members of the Munition Carriers Association, have purchased a 1953 Ford pickup truck to convoy explosives through town. This truck is driven by a man instructed and periodically checked by this Department. The truck is equipped as follows:

Two-way radio telephone
2 long handled shovels
3 blinker-type red electric lanterns
2 "explosive" signs to be used with lanterns
Supply of spare red flags
Supply of spare "explosive" signs
100' of one-inch rope
1 axe
1 first aid kit
Flares—to be used no closer than 100 feet from any explosives truck
2—2½ gal. water extinguishers
2—20 lbs. dry chemical extinguishers
Truck is also equipped with a heavy duty generator so that drills, etc., can be run off it for roadside repairs.

We have had several fires involving L. P. Gas and gasoline trucks. You probably have heard of the L. P. Gas truck-school bus accident of 1952. July 17, 1953, we had an accident in a tunnel approach to the Santa Ana Freeway involving a tank truck and trailer loaded with gasoline, a lumber truck, a panel truck and 3 passenger cars. By some miracle, no one was hurt, but the 2 trucks and one car were involved in fire from a ruptured gasoline fuel tank. An extremely quick stop was made by our

Department with the use of the 2½" tog nozzle. There have been many other incidents of similar nature too numerous to mention.

An incident of a different nature occurred at the Railway Express Depot. A fork lift truck punctured the side of an aluminum drum containing 90% strength hydrogen peroxide. This Department responded and found the container had been placed with the puncture up, and, fortunately, fire had not occurred. Extreme caution was exercised in the hauling of the drum to the bank of the Los Angeles river, into which the drum was emptied. It was dumped into hose streams to immediately dilute it to prevent occurrence of fire. Had we not been familiar with the characteristics of this chemical, a serious fire could have occurred through failure to take proper precautions.

It is our belief that the answer to the problem is closer control by all Fire Departments over transportation through their city, such as we are doing in Los Angeles. It would seem, also, that the I.C.C. regulations for tank trucks need revising in light of what happened at Blythe, California, early this month. Casinghead gasoline was being transported under extremely hot weather conditions (114°F) in an ordinary gasoline cargo tank (tested to 3 psi by I.C.C. requirements); when the driver opened the dome cover, the vapors under pressure blew him off the truck, killing him, and then spread to a source of ignition. The resulting fire killed another truck driver and destroyed 2 tank trucks and trailers and an adjacent building. In all actuality, the vapor pressure of casinghead gasoline does not exceed 40 psia at 100°F. and is, therefore, permissible to ship in MC300, 301, 302 or 303 cargo tanks which are tested only to 3 psig. This would hardly seem equitable when we consider that API and ASME codes require tests of 4 and 5 times the working pressure of the vessel.

G. E. Courser

Chief, San Diego Fire Department
San Diego, California

Vehicles of all types used in transporting flammable liquids, gases, explosives and other hazardous materials in this city must conform to safety regulations established by the Fire Chief and standards of the N.B.F.U.

L.P.G. Products

A permit to transport L.P.G. through the high value district of the city must be obtained from the fire department unless:

1. The transporting vehicle travels specified routes. (Through-streets of freeway proportions.)
2. The transporting vehicles requires weight or measure inspection. (Route to weigh station to be designated by Fire Chief.)
3. The transporting vehicle requires bona fide repairs.

L.P.G. cannot be temporarily or permanently stored in the high value district without a permit previously obtained from the Fire Department. Violators are guilty of a separate offense for each unlawful trip or storage.

Explosives and Flammable Liquids

It is unlawful to keep, store, sell, use or transport explosives within the city limits without a written permit from the Fire Chief. These permits are not transferrable and must be renewed annually.

The operator of the transporting vehicle must be over 21 years of age and of proven capability. The vehicle itself must be in good condition for service and must have a top extending over the bed or be equipped with a suitable cloth cover for covering the explosives.

All explosives stored or transported must be enclosed in tight metal, wooden or fiber containers, plainly labeled. Each explosive transport vehicle must bear an "EXPLOSIVES" label in plain sight at sides and at back.

Vehicles carrying explosives must remain at least 500 feet apart in transit and travel over routes through sparsely populated areas of the city whenever possible. The quantity of detonators carried by any one vehicle is limited.

The storage, handling, transportation and use of all inflammable liquids in the city is governed by strict regulations enforced by the Fire Chief. These regulations include limitations on amounts of gasoline stored below and above ground, specifications for petroleum storage tank size and construction, delivery of petroleum products, and hazards peculiar to self-service gasoline stations.

There have been few fires in this city involving vehicles transporting flammable liquids, explosives or other hazardous materials. Our last serious fire of this nature occurred in November, 1948, when a transport truck loaded with 2,500 gallons of gasoline overturned on one of our principal streets bordering the waterfront. This fire occurred within the limits of the high value district, but prompt action by first alarm companies confined it to the truck. Large fog streams were used and extinguishment was effected in a few minutes.

Seven hundred gallons of gasoline remained in the truck tank after the fire was extinguished. This was pumped into another vehicle and dry ice was then used to de-gas tank compartments before the burned vehicle was towed from the scene.

I believe our excellent record concerning transport vehicle fires of this nature is due to strict enforcement of adequate regulations governing the various aspects of the problem.

In dealing with this situation, we have been extremely careful to keep the legal process of setting up these regulations flexible so new regulations can be formulated to meet changing conditions before hazards created by such changes become acute.

Another contributing factor is the fire safety and prevention education campaign conducted by the fire department at bulk oil storage plants in the city.

Top: One of the greater hazards incidental to highway accidents involving carriers of flammable materials is the involvement of neighboring structures. When this tanker, carrying asphalt products, took fire at Wilmington Manor, Del., it was only with difficulty that exposed frame dwellings were prevented from being ignited.

Bottom: When his tanker took fire in Franklin, Ohio, 4,100 gallons of gasoline and the truck itself, were lost. Tavern owner across the street protects his establishment against radiated heat.

Frequent demonstrations are a part of this program and are attended by off-duty fire department personnel as well as plant emloyes.

H. C. Fisk
Chief, Tacoma Fire Department
Tacoma, Washington

We have limited certain streets that cannot be used by trucks carrying flammable liquids and explosives. We have a firm that moves large tanks of sulphuric acid from the North End of the City to the East End. This route carries them through the City. We limit them the use of the water front road through the Sperry Tunnel. This tunnel area has been sprinklered.

Many years ago we had a tank truck filled with gasoline get loose and come down a steep hill and set a two-story retail building afire.

All tank trucks are subject to inspection by the Fire Departmen and we have rigid rules applying to all gasoline and oil tank trucks. Today we have many products carried in tank trucks, even milk. All such tank trucks are marked. There is also a growing tendency to increase the size of the gasoline tank trucks. We prohibit the large semi-tank trucks from making what we call milk stops; in other words, they can make just the one delivery.

Thomas J. Maloney
Chief, Fire Division
Jersey City, New Jersey

There are State Laws in New Jersey governing the movement of flammables, explosives and other hazardous materials by truck through the streets. There are also city ordinances covering the above.

Any truck carrying flammables through the streets of Jersey City must first obtain a permit from the Bureau of Combustibles. No deliveries by truck are allowed to city piers. Loading (ships) must be done offshore by lighters.

After application is made to the Bureau of Combustibles, a route will be prescribed to the applicant on his permit, usually on the outskirts of the city. He is not allowed on other streets except to make a delivery.

In recent years we have had no serious accidents, but we did have a gasoline spill. At 12:33 p.m., Saturday, December 22, 1951, Engine 13, 28 and the Chief of the Second Battalion responded to an Emergency Call at 142 Danforth Avenue, a one-story brick garage owned by the Headden Fuel and Oil Company of 1921 Bergen Avenue.

Upon arrival, it was found that a gasoline delivery truck had overfilled the tank by approximately two-hundred and thirty (230) gallons. This overflowed into the sewer lines. All inhabitants of the immediate neighborhood were warned to refrain from smoking, to put out the pilot lights in their gas stoves, and to open all windows.

As lines were put into the sewers, the Fire Prevention car with its amplifying system was summoned to warn the inhabitants in the adjacent area urging the people to use the same precautions mentioned before. At the same time (through the radio system) it was learned that 22 Engine and the Deputy Chief had been dispatched because of subsequent calls from persons living almost a block away from the scene complaining of gasoline odors in their houses.

All manhole covers were removed from the sewers from Old Bergen Road to Princeton Avenue on Danforth and Cator Avenues. Three streams were used to drive the gasoline through the sewers. Approximately 16,000 gallons of water were used before returning to quarters at 2:42 p.m.

As to the ultimate answer, if stricter laws and ordinances cannot be enacted, the present laws must be strictly enforced.

John H. Krusenklaus
Chief, Division of Fire
Louisville, Kentucky

We have, in cooperation with transport companies, worked out agreed routes to be used. For a time, in the case of high explosives, the truck driver, upon reaching the city limits, notified the Police Department and an escort was furnished. This, however, became such a burden on that department that the practice had to be discontinued. When possible, such escort is furnished by the personnel of the Fire Prevention Bureau. We do not permit over-night or prolonged parking of trucks carrying high explosives within the city.

These vehicles are restricted to specified streets when passing through Louisville or traveling from one local terminal point to another—except fuel supply trucks, and these are required to make deliveries in the congested business areas at night.

Only one serious fire has been experienced, and this was due to the carelessness of a tank truck driver. He left his truck during filling operations, permitting a quantity of gasoline to flow from the tank into the street, where it became ignited. The picture herewith was taken the following morning, and shows some of the damage caused.

I do believe that transportation by rail, particularly of high explosives, also presents a very serious problem.

Edward Blohm
Chief, Fire Department
Detroit, Michigan

Tank vehicles used to transport flammable liquids in Detroit are subject to annual inspection and licensing by our Fire Prevention Division.

According to local ordinances, vehicles carrying explosives and other hazardous materials in Detroit are required to be properly identified.

Our Flammable Liquids Ordinance prohibits the delivery of flammable liquids within what would commonly be referred to as the "loop" area in double trailers (sometimes known as "double-bottom" carriers). Where double carrier units of this type must travel from one side of the city to the other through the high value area, one thoroughfare has been designated for that purpose. However, under no circumstances can deliveries be made from such units in that area.

When information is received regarding the transportation of explosives or other hazardous materials in the city, specific routes are suggested, depending on destination.

We have had three fires involving gasoline tank trucks and trailers in recent years:

July 10, 1946, a trailer hitch broke between a semi-trailer and four-wheel trailer, each containing 4,000 gallons of gasoline, while proceeding along a highway in the outskirts of Detroit. The safety chains held, but when the driver attempted to stop, the four-wheel trailer tipped over and pulled the semi-trailer over. The trailers broke loose from the tractor and immediately burst into flames. The gasoline was consumed and the trailers extensively damaged. Fortunately, the area was sparsely built up and there was little other damage.

June 27, 1947, a tractor drawn semi-trailer and four-wheel trailer combination was involved in an accident at 1:09 A.M. at East Grand Blvd. and John R. Street in Detroit. In attempting to avoid a car running a red traffic signal, the tractor driver swerved his truck, causing the tractor and semi-trailer, containing 3,200 gallons of gasoline, to tip over. The four-wheel tank trailer broke loose but remained upright and ran up over a

Damage caused to residences and parked cars at Louisville when gasoline, overflowing from tank truck, became ignited.

high curb into a tree. The semi-trailer burst into flame and the driver was enveloped in flame as he attempted to run from the truck. He died as a result of burns. The burning gasoline spread out over a considerable area of this wide intersection.

July 1, 1948, a tractor hauling a semi- and a four-wheel trailer combination containing 10,000 gallons of gasoline was going north on Livernois Avenue in Detroit, a residential and industrial area. A fire started at the rear of the four-wheel trailer in overflowing gasoline and spread over both trailers and involved several buildings and automobiles in the vicinity. Cause of fire was attributed to sparks from static chain igniting the gasoline spilling to the pavement as the tractor and trailers moved along the street.

We have had no incidents involving explosives or other hazardous materials.

It is my opinion that the movement of flammable liquids by truck through congested areas of cities should be restricted and that regulations should be established to prohibit the movement of "double bottom" carriers through such area. I do not believe that the limiting of tank capacities serves any particular purpose, as it would only result in more tank truck movements. For all practical purposes, a fire involving a tank truck or trailer carrying 1,500 gallons of gasoline is no less a problem than when 5,000 or 7,000 gallons become involved.

In every instance, carriers of explosives should be routed around a city where inter-city traffic is involved. Where explosives are being delivered into a city, they should be made to wait outside the city until a police escort is provided and routed by them to destination.

Murry A. Wolz
Assistant Chief in Charge
Fire Prevention Bureau
Denver, Colorado

Concerning the hazard incidental to the movement of flammables, explosives and other hazardous materials by trucks through city streets:

In answer to questions one and two, the Manager of Safety and Excise exercises control by an emergency order. This order directs travel, by vehicles carrying explosives or flammables in quantities exceeding 1,500 gallons, to certain streets. An ordinance to replace the order is being written.

In answer to number three, we have had one multiple alarm fire resulting from a collision of a train and a 6,000 gallon gasoline transport and two other fires involving 1,500 gallon capacity trucks.

At present, the feeling in Denver is to equip the vehicles with mechanical safeguards and to educate the employe and the public along safety lines, and to lower the speed limit of these vehicles.

R. L. Woolard
Chief, Fire Department
Norfolk, Virginia

The Fire Prevention Code of Norfolk represents our control of the situation and the regulations contained therein are as follows:

Explosives:

(a) A permit must be obtained from the Public Safety Director.

(b) It is prohibited for any person to transport any explosives in or upon any public conveyance which is carrying passengers for hire.

(c) It is prohibited for any person to transport the following explosives in any quantity: Liquid nitroglycerine; high explosives containing over 60 per cent of nitroglycerine (except gelatin dynamate); high explosives having an unsatisfactory absorbent or one that permits leakage of nitroglycerine under any conditions liable to exist during transportation or storage; nitrocellulose in a dry and uncompressed condition, in quantity greater than ten (10) pounds in one exterior package; fulminate of mercury in bulk in a dry condition, and fulminate of all other metals in any condition, except as a component of manufactured articles not herein forbidden; or explosives containing an ammonium salt and a chlorate.

(d) Every vehicle carrying explosives shall have painted on its front, sides and rear, in easily legible letters at least four (4) inches high, in contrasting colors, the word "EXPLOSIVES," or in lieu thereof, shall display in such a manner that it will be visible from all directions, a red flag with the word "DANGER" printed, stamped or sewn thereon in white letters. Such flag shall be at least twenty-four (24) inches square and the letters thereof shall be at least six (6) inches high.

(e) It is prohibited for any person in charge of a vehicle containing explosives to smoke in or upon such vehicle, to drive vehicle while intoxicated, to drive vehicle or to conduct himself in a careless or reckless manner or while smoking or intoxicated.

(f) It is prohibited for any person to place or carry in the bed or body, or cause to be placed or carried in the bed or body of any vehicle containing explosives any metal tool or other piece of metal, or any matches.

(g) It is prohibited for any person to place or carry, or cause to be placed or carried in any vehicle containing explosives, any exploders, detonators, blasting caps or other similar explosive materials.

(h) No person shall carry, in any vehicle, or in any other manner, any quantity of gunpowder exceeding two (2) pounds in or through the City, unless the same shall be secured in good bags and covered with a suitable covering, under the penalty of Five Dollars for every barrel, half barrel, cask, keg or other container so carried.

Tank Trucks and Trailers:

(a) All trucks used for the transportation of flammable liquids in bulk quantity exceeding 100-gallons shall be inspected by the Officer-in-charge of the Bureau of Fire Prevention, and unless certified by him as to their compliance with this ordinance, they shall not be operated on the streets of the City of Norfolk; provided that this certification shall not be required for trucks bearing the license or approval of the Interstate Commerce Commission; or the license or approval of the State Highway Department; or to trucks transporting flammable liquids in drums, cans and other containers of less than 60-gallons individual capacity.

General Requirements of Tank Trucks and Trailers:

(b) Tank trucks and trailers shall be constructed as described in sub-section 613-D. Piping, safety devices, filling and the loading and unloading of tank trucks and trailers shall be as specified for containers. Pumps of suitable design and properly protected may be mounted upon trucks and trailers and may be driven by the truck motor power take-off or other suitable means. The pumps, except constant speed centrifugal pumps, shall be equipped with suitable pressure actuated by-pass valves permitting flow from pump discharge to pump suction when the pump discharge rises above a predetermined point.

Every tank truck and trailer shall be provided with properly attached steel bumpers or chassis extension at the rear which shall be so arranged as to adequately protect the tank, piping, valves and fittings in case of collision.

Operation of Tank Trucks and Trailers:

(c) No truck transporting flammable liquids in bulk shall be left unattended

Maintaining gasoline transport routes reduces, but does not entirely eliminate, the likelihood of accident. This was the scene after a gasoline transport truck crashed into an office building in Omaha, Neb., and burst into flames, killing the two men in the cab of the tanker. The fire department did a good job in bringing the fire under control quickly.

A flaming gasoline truck lies across the road near Michigan City, Ind., after being hit by a cattle truck (left) and setting fire to the rear of a school bus. Heroic bus driver yanked about sixty children out of the school bus to safety. The cattle truck driver was killed.

In November of 1952, the Defense Department ordered warning signs like that pictured above placed on all vehicles carrying explosives for the armed forces. Signs must be in 8-inch red letters, and posted on front, rear and both sides of the truck.

on any street, highway, avenue or alley, provided that this will not prevent a driver from the necessary absence from the truck in connection with the delivery of his load, except during actual discharge of the liquid when some responsible person must be present at the vehicle; nor shall it include stops for meals during the day or night if the street is well lighted at point of parking.

Trucks containing flammable liquids may be parked in open parking lots or on private property. They shall not be parked or garaged in buildings other than those specifically approved for such storage by the Officer-in-charge of the Bureau of Fire Prevention.

(d) Tanks shall be constructed of open hearth or blue annealed steel, or other suitable material of a strength equivalent to the following table:

Aggregate Capa. Gals.	Minimum Thickness of Steel Shell	U. S. Standard Head
Up to 600..	14-Gauge	14-Gauge if bilged otherwise 12-Gauge
600 to 1200.	12-Gauge	12-Gauge if bilged otherwise 10-Gauge
Over 1200 ..	10-Gauge	8-Gauge

Tanks exceeding 1,200 gallons in capacity may be constructed with 12-gauge shells and 10-gauge heads provided they are sub-divided into compartments of 600 gallons or less.

Shell and head joints shall be welded, riveted and welded, brazed or riveted, an brazed, riveted and caulked, or made tight by some equally satisfactory process.

Each compartment of the completed tank shall be tested and proven tight at 5-pound minimum pressure. Fill openings shall be 4 inches minimum diameter

Tanks used for Class 1 liquids larger than 1,500 gallons capacity shall be subdivided by double bulkheads into compartments, none of which shall exceed 1,200 gallons capacity.

All tank vehicles shall be equipped with pneumatic tires on all wheels.

Each tank compartment shall be provided with a suitable operating vent, and in addition thereto, emergency venting facilities not less than 1 29/32-inches internal diameter for a 600 gallon compartment, and of corresponding size and capacity for larger tanks to prevent rupture of the tank from such internal pressures as may be created by exposure fires. Tank dome covers shall not be removed or loosened except while tank truck is being filled.

All draw-off valves or faucets shall have discharge and threaded or otherwise so designed as to permit a tight connection with hose extending to fill-pipe.

Every tank truck shall be provided with properly attached rear steel bumpers. The rear bumpers or chassis extension shall be so arranged as to adequately protect the draw-off valve or faucets in case of collision.

Each compartment of a gravity discharge tank truck for Class 1 liquid shall be equipped with a reliable and efficient shut-off valve located inside the shell of the tank in the compartment outlet, and except during delivery operations such valves shall be automatically kept closed, or shall be so inter-locked with delivery operation that it will be mechanically closed when delivery operations are completed.

The operating mechanism for such valves shall be provided with a secondary control, remove from the tank filling parts and discharge faucets for use in event of accidents of fire during delivery operations, and such control mechanism shall be provided with a fusible section which will cause valves to close automatically in case of fire.

In every case there shall be provided between the shut-off valve seat and discharge faucet, a shear section which will break under strain and leave the shut-off valve seat intact.

Tanks, chassis, axles and springs shall be metallically connected.

During the filling operation metallic contact shall be maintained between the fill pipe and the tank truck.

The foregoing provisions shall also apply to the construction and operation of trailers and semi-trailers. All trailers shall be firmly and securely attached to the towing vehicle by means of suitable draw-bars, supplemented by safety chains.

Every trailer shall be equipped with a reliable system of brakes with reliable provisions for operation from the driver's seat of the vehicle drawing it.

Every tank truck and trailer shall be equipped with at least one approved hand fire extinguisher of a type suitable for extinguishing oil fires.

The permit for transporting explosives shall designate the route and other conditions whereon the same may be transported. Vehicles carrying explosives are met at various rendezvous points at entrance to the city by the Police and Fire Department cars and are escorted to point of destination via a short uncongested route at a speed not exceeding twenty-five (25) miles per hour.

We have not had to cope with fires or other catastrophes in recent years resulting from accidents involving trucks carrying the materials in question.

In my opinion, the ultimate answer to this growing problem is the provision of additional personnel in the Fire Prevention Bureau in order to handle this special work without detracting from routine inspection duties. We have been escorting an average of 1,000,000 pounds of explosives per month which for the most part represent Navy and Coast Guard movements.

John C. Klinck

Chief, Memphis Fire Department
Memphis, Tennessee

Concerning the movement of flammables, explosives and other hazardous materials by truck through our city streets, this department presumes the above to mean and include any chemical compound or mechanical mixture that contains any oxidizing and combustible units, or other ingredients, in such proportions, quantities or packing that an ignition by fire, friction, by concussion, by percussion or by detonator of any part of the compound or mixture may cause such sudden generation of highly heated gases that the resulting gaseous pressures are capable of producing destructive effects on contiguous objects or of destroying life or limb.

This problem, in our city, is handled by the police department, who require a permit from the Commissioner of Fire and Police and notification of arrival at city limits, where an escort is provided to the opposite city limits. Carriers are not permitted to stop for any purpose while in route through city.

At the present time, any well paved through streets are used, but a specific route is under consideration.

In 1947 an accident involving a gasoline trailer truck loaded with 5,350 gallons of this liquid resulted in the loss of life to the driver and his assistant. This was caused by the truck making a sharp turn underneath a viaduct, resulting in the over-turn of the trailer, spilling gasoline and enveloping the truck and surrounding area in flames.

It is the opinion of this department and that of the police department that a diverted route around the city would greatly lessen the danger of this operation.

Other regulations governing while carrying explosives follow:

357. Vehicles carrying explosives to be marked, etc.—Every vehicle, while carrying Class II explosives, shall have painted on its sides and back, in easily legible white letters at least six inches high, the words "Explosive—Dangerous," or in lieu thereof, shall display upon an erect pole on the front end of such vehicle and at such height that it shall be visible from all directions, a red flag with the word "Danger" printed, stamped or sewn thereon in white letters. Such flag shall be at least eighteen inches by thirty inches in size, and the letters thereon shall be at least six inches high.

(a) Driver of such vehicle not to smoke; shall drive, load and unload carefully. It is prohibited for any person in charge of a vehicle containing such explosives to smoke in or upon such vehicle, to drive the vehicle while intoxicated, to drive the vehicle or to conduct himself in a careless or reckless manner, or to load or unload such vehicle in a careless manner or while smoking or intoxicated.

(b) Metal not be carried in bed of vehicle. It is prohibited for any person to place or carry in the bed or body or cause to be placed or carried in the bed or body of any vehicle containing such explosives, any metal tool or other piece of metal.

(c) Blasting caps, exploders or matches not to be carried in bed of vehicle. It is prohibited for any person to place or carry, or cause to be placed or carried, in the bed or body of any vehicle containing explosives, any exploders, detonators, blasting caps or other similar explosive material, or to carry in or upon any such vehicle any matches. (1931, 737.)

R. C. Malmquist

Chief, Fire Department
Minneapolis, Minnesota

Relative to the question regarding control over the movement of trucks carrying:

Flammable Liquids:

Our present ordinance, as far as flammable liquids are concerned, has no restrictions on the movement of trucks other than the fact that the attendant must remain close to the truck from the time the filling connection is made until the delivery is completed.

Explosives:

Our present ordinance, as far as explosives are concerned, provides that the person, firm or corporation must make a written application for and obtain a permit to transport explosives within the City of Minneapolis, which permit shall, when granted, designate the time when such transportation shall be made and the route to be followed.

Other Hazardous Materials:

Our present ordinance, as far as other hazardous materials are concerned, provides that they may be transported in approved cylinders which are acceptable for distribution in interstate commerce and marked to the effect that they comply with the Interstate Commerce Commission's specifications and regulations.

Our present ordinances do not limit movement to any certain streets.

Several years ago, a gasoline truck collided with a street car at one of our busy downtown intersections. The gasoline truck tipped over, causing a spillage of gasoline, but no fire occurred. There were no injuries or property damage other than the slight damage to the gasoline truck when it tipped over.

It is our opinion that there should be an ordinance providing for the routing of such trucks, especially through the high value district. This ordinance should designate which streets are to be traveled on. However, we do have fairly good control over all hazardous materials and explosives by virtue of the fact that our Fire Prevention Code is in effect an enabling act charging us with the enforcement of specific ordinances as well as other ordinances and State laws and therefore has very broad powers.

Lester R. Schick

Chief, Fire Department
Davenport, Iowa

Currently we have no control over such trucks as far as movement through the streets are concerned. We do restrict the parking of such vehicles, on the streets, to necessary business stops, and while eating, etc.

Movement is not limited to certain streets at present. A proposal to limit such travel to one street through the fire zone has been submitted to the council, and will undoubtedly receive approval upon completion of a street improvement program.

In my opinion such equipment should be required to by-pass a town whenever possible. Where such a program is not feasible, strict control over routes of travel should be established, with congested areas being avoided whenever possible.

F. Litteral

Acting Fire Chief, District of
Columbia Fire Department
Washington, D. C.

Tank wagons or tank trucks, when containing Class I inflammable liquids, are not permitted to remain on the street or a filling station for any greater length of time than is necessary to transport such liquids from one part of the District to another and to load and unload the contents thereof. Explosives in any quantity, except gunpowder, not in excess of five pounds, require a permit approved by the Fire Chief.

We do not limit movement of inflammable liquids to certain streets, but we do limit movement of explosives in excess of fifty pounds.

The intra District regulations for the transportation of flammable liquids and explosives has to date quite adequately served the purpose of reducing transportation hazards of such substances. Since the recent lifting of the Inter-State Commerce Commission's order that common carriers will no longer be exempted from local rules and regulations concerning movements of trucks handling flammable liquids and explosives, our Police Department, at present, is working out specific routes through the District which they will be required to use.

L. L. Petrey

Chief, Mobile Fire Department
Mobile, Alabama

We have no control over trucks carrying flammable materials other than the fact that they are not allowed to pass through the Bankhead Tunnel. They are routed over Mobile River bridge, which is seven miles further.

Explosives are routed through certain specified streets.

Fortunately, we have had no fires or other accidents involving such trucks.

In my opinion each city should have a law routing trucks carrying such materials around the part of the city that is not heavily populated.

J. P. Newark

Chief, Fire Department
Grand Forks, North Dakota

Our basic control is derived from a City Ordinance adopting the National Board of Underwriters Code on the Transportation and Storage of Flammable Liquids and Explosives. Once each year all local tank trucks are inspected by an Inspector from the Fire Department. Lights, brakes, flares, fire extinguishers, tank condition, piping, valves, pumps, and lettering describing the cargo, are inspected. An "OK" sticker is issued when the above items are satisfactory; if they have not complied with our suggestions, we will not approve their license renewal. Speed is not to exceed 20 mph, and trucks must stay at least 300 feet apart when traveling in the same direction. Parking on the streets is prohibited, unless an emergency exists or an attendant is on duty unloading.

The ICC licensed transports are carefully checked at the Pipeline Tank Farm by the employes; if any defect is found in any compartment, that compartment will not be loaded. This defect must be repaired before any more gasoline is issued.

We have certain specific streets outlined for transportation of flammable liquids; however, streets other than the prescribed streets may be used where such liquids are being transported to or from bulk plants or service stations, said travel to be on streets with shortest travel from the described streets.

We have had only one fire in a fully loaded transport. The semi became detached from the tractor, and when the semi front end struck the pavement on a downtown street, it created sparks, setting fire to the load. We used a 500 GPM Rockwood Fog Nozzle under 200 pounds pressure and extinguished the fire.

The extension and greater use of pipelines would eliminate some of the hazards; however, we have found as a rule the large transport companies are safety-conscious and have strict rules for the drivers to follow and do not

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Michigan's Costliest Fire Destroys Auto Parts Plant

Inadequate Plant Fire Protection Largely Responsible for Huge Loss

A STAFF REPORT

A $35 million fire, which virtually destroyed the General Motors Corporation transmission and instrument plant at Livonia, Mich., on August 13th, has been recorded as one of the nation's largest individual insured fire losses. The fire not only wrecked the $40 million plant—only four years old, but it resulted in the death of five men (three during the fire and two later) and injuries to a score of others. It threw an estimated 45,000 workers, in the various automobile plants using the transmissions made at Livonia, out of jobs, at least temporarily.

Only an office building and a small power plant were reported salvageable of the 1.5 million square feet of floor space at Livonia. It is also reported that few of the 6,000 machines in the plant may be reclaimed, owing to its almost total destruction.

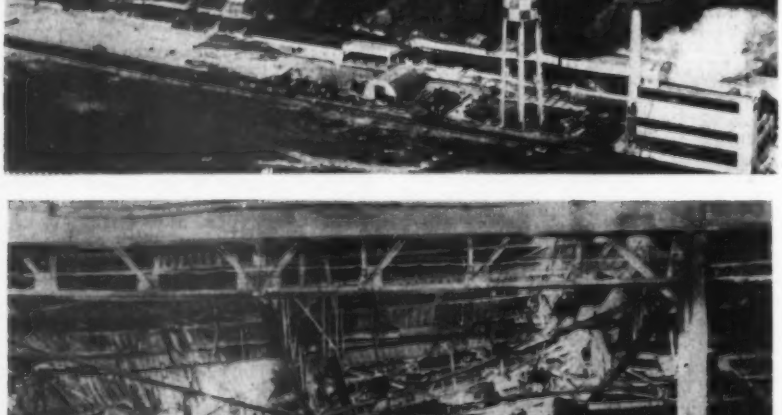
Latest reports indicate the cause of the destructive blaze was a spark from a welder's torch which ignited oil. The fire started just before the change in shifts and safety personnel managed to clear the 3,200 employes out of the structure. Members of the oncoming shift who arrived to find their plant in flames, were recruited as emergency help, to aid fire fighters, assist in policing the grounds and salvaging what could be removed from the structure.

Those are the highlights of an epochal disaster which, according to Michigan Fire Marshal Arnold Renner was the costliest blaze of its kind ever to strike the state, and for which there was no valid excuse.

The fire started at 3:45 P.M., and within three minutes had traveled the 1,200 foot length of the sprawling plant, despite the installation of what was said to be the "most modern fire-prevention and fire quenching equipment."

The plant manufactured GM Hydra-Matic transmissions for the corporation's own Cadillac, Oldsmobile, and Pontiac cars and GM and Chevrolet trucks as well as Lincoln, Nash and Kaiser cars. It also supplied some Army vehicles. In addition to transmissions, 500 or more employes of the Ternstedt division of the corporation were making the T-41 range finder for the medium Army tank weapons. The work was done in a guarded corner of the big plant and security measures were taken to keep unauthorized persons out of the area during and after the fire.

To the workers, and the official GM family, the building and production processes measured up fully to all established fire and safety codes. It was admitted, however that the original building was enlarged several times, and there were no effective fire stops to divide up the large floor areas. Also, the the sprinkler system did not cover the entire plant. Furthermore, production involved the use of flammable oils, greases and chemicals, all of which provided fuel for a fire of sufficient heat to melt floor and roof supports, and to collapse walls.



Top: Sprawling four-block plant at height of fire.

Bottom: One section of fire gutted General Motors Transmission Plant. Fire fed by flammable oils and chemicals melted or warped metal girders and other non-combustibles to ruin plant and cause loss that may exceed $35 million. Welder's spark caused blaze. Five were dead and scores injured, as result of 14-hour holocaust.

Welder's Spark Probable Cause

The cause is laid to a spark from a welder's torch, which landed in a metal trough beneath a conveyor line carrying transmision parts dipped in oil and then sent through a cleansing fluid called oleum. The trough was 13 feet from the plant floor and 7 feet from the ceiling.

Apparently a spark from the torch, which was being used above the conveyor line, ignited the cleansing fluid in a drip pan. The fire spread rapidly down the trough to a storage tank, which exploded. Before the explosion, employes tried to fight the fire with hand extinguishers and reportedly they had almost controlled the blaze, not-

withstanding the difficulty of hitting the fire so high from the floor, when someone stretched in a hose line and turned water on the trough, almost instantly spreading the fire over the area. The tank explosion touched off additional blasts in other tanks and the fire communicated rapidly to oil-loaded machines which flared up, further spreading the blaze, and driving the plant workers outside.

There appears to be some difference of opinion as to the adequacy of the sprinkler system. The state fire marshal's office reports that only 10% to 15% of the plant was sprinkler-protected; others say the area was greater. It is said, sprinklers in the affected area went into operation but were unable to control the fast-spreading blaze. In many places the wood block floor blazed where oil had been spilled.

The fire traveled rapidly from division 501 to 502, and thence to involve the entire plant, driving out employes who paused to try to fight it, killing the acting plant security officer, Lieut. Wm. G. Degner and another worker, Daniel S. Staley. A volunteer fireman, Richard Smith, of Livonia, died during the struggle, of heart failure while packing hose. Two workmen were killed a day or two later when their wrecking crane struck a high tension line. A long list of personnel suffered injuries, including plant employees and firemen, none of them serious. Some of the casualties were telephone operators who stuck to their switchboards to the last minute.

Fire Fighters Overwhelmed

Once the blaze got under way, witneesses said, an army of firemen could not have stopped it. However there remain sharp differences of opinion concerning the response of some of the aiding fire forces, and their ability to get water on the blaze.

According to a report released by the City of Livonia, in whose protective district the plant was located, Fire Chief Calvin L. Roberts had arrived back from a vacation just 11 minutes before the telephone alarm was received at 3:56 P.M. The call was answered by Fireman Wilfred Clark, and Chief Roberts listened in. They heard Lieut. Joseph A. Supak of G.M. plant protection say: "This is the Detroit transmission plant calling. There is a bad one going here. We need your help right away."

Chief Roberts turned and looked out the window, to see smoke billowing high in the air. He immediately ordered all Livonia stations to the scene and called the fire departments of Plymouth, Plymouth Township, Wayne and Redford Township. He then went directly to the fire in his own car, entering the west gate, as directed by Lieutenant Supak. There he met James Hagen, city director of public safety.

Chief Roberts suggested that Hagen contact Mayor Ziegler of Livonia by telephone and request him to get help from the Detroit Fire Department. This was done.

The chief further instructed Sergeant Farrand Perry to contact Dearborn and all other departments under mutual aid agreements with Livonia. All off-duty men of the Livonia force were called in and all reported for work. Chief Robert McAllister of Plymouth located a piece of apparatus at the Livonia Merriman road station and Redford Township's north station gave protection to Livonia's north area.

According to Chief Roberts, "After the first half hour, the plant was completely involved in flames." His first observation was that his department could not put out the blaze. His report states their only chance was "to get behind it and cut it off." The chief ordered lines to the roof of the administration building to prevent extension of the fire to that structure which housed the offices and records. Further, in the effort to get behind the fire and cut it off, the chief moved equipment, two bays, or about 100 feet, behind the flames. But by the time the fire fighters had got their lines moved, the fire had beat them to it. "We just couldn't lick it," reported Chief Roberts, "the fire traveled faster than we could move our lines. So we spotted our trucks where they would do the most good and concentrated on saving the administration building."

It is reported that some 30 pieces of fire apparatus fought the blaze, including units from Detroit, Northville, Dearborn, and Lincoln Park, in addition to those communities previously mentioned. In this connection, reports of operating forces are in conflict. According to Detroit Fire Commissioner David Pollack, there was inadequate water for the engine companies dispatched by that city. In rebuttal Livonia's Mayor Zeigler, and Albert Kunze, director of Wayne Water Supply System, which furnished water to Livonia and surrounding areas said there was plenty of water pressure. "If the Detroit River had been running right alongside the plant they still would never have been able to put that fire out," the director added. He said he made checks of the water pressure at the county system's pumping station on West Chicago at Middlebelt at 5:30 P.M. and 8:00 P.M. and pressures of 90 pounds were recorded. This compares with Detroit's 40 pounds, he said.

Of Detroit fire equipment, including three engine, one ladder, one rescue companies and one battalion chief, which responded, the pumpers stood idle because connections with adequate pressures could not be found, according to press reports. At 5:30 Comr. Pollack protested that water sources and pressures were lacking. But, according to accounts, the city's firemen were attempting to draw water through the storage tank for the plant's automatic sprinkler system. This reportedly had been emptied by sprinkler discharge. The Detroit contingent then learned it could hook into a hydrant 2,000 feet to the east and subsequently stretched in from there.

There is no contractural agreement between the City of Detroit and Livonia covering aid by the city to the latter. Detroit officials claim that Livonia could have had help from the city 30 minutes sooner if the community had entered into a contract for standby protection such as the City has with some other suburban areas. Livonia, in 1950, declined to make an agreement to pay a fee of 3 cents for each $1,000 of assessed valuation on buildings and personal property for the additional protection, which it is said would have cost approximately $1,300 yearly. About 90 per cent of the other suburban Detroit communities likewise declined to contract for the service because of cost.

The first call received by the Detroit Fire Department was clocked at 4:10 P.M. Permission to respond was of necessity asked of the Mayor of Detroit and this consumed 22 minutes. Meanwhile the nearest Detroit company was

(*Continued on Page* 855))

Smoke pall signals end of GM transmission plant. Over 300 regular and volunteer fire fighters, with 30 pieces of equipment, were impotent in combating oil and wind sped flames that roared through sprawling four-block plant. Misdirected first aid fire fighting helped give fire start.

What Progress in Fire Service Training Facilities?

Surveys Indicate Lack of Drill Towers and Other Facilities For Out-of-Door Practical Training

By ROI B. WOOLLEY

Editor's Note: This is an endeavor to review developments in perhaps the most important phase of firemanship training; the physical facilities available for practical, field fire fighting, and training-by-doing.

Surveys by *Fire Engineering*, upon which much of this study is based, disclose slow progress in the improvement of municipal fire training facilities. With but few exceptions, the progress being made in the field of "training-by-doing" has been at the state level. Although many municipal fire departments have blueprinted modern training facilities similar to the New Haven Testing and Proving Ground, appropriations for these installations are lagging.

Nevertheless, the outlook for the future in this endeavor appears bright. It is hoped that this message may fortify those fire officials who are striving to revitalize and modernize their training facilities, particularly the physical and mechanical properties essential to the teaching of firemanship under actual fire fighting conditions.

THE statement has been made that the most important change which has taken place in the fire service in the past quarter of a century is the growing interest which firemen are taking in the various programs of instruction, including the practical methods of fighting fires. This interest is by no means confined solely to the paid fire departments.

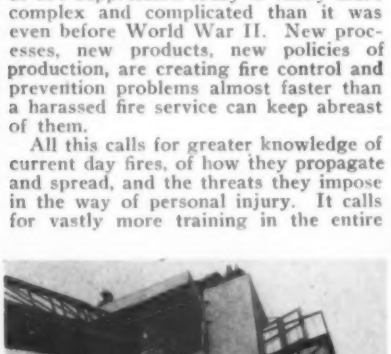
There is no question but the business of fire suppression today is vastly more complex and complicated than it was even before World War II. New processes, new products, new policies of production, are creating fire control and prevention problems almost faster than a harassed fire service can keep abreast of them.

All this calls for greater knowledge of current day fires, of how they propagate and spread, and the threats they impose in the way of personal injury. It calls for vastly more training in the entire field of fire extinguishment, both theoretical and practical training. It calls for more scientific approach to these problems; the development of more scientific techniques in fire control, both in the laboratory, the class room, and in the field. It calls for a greater degree of cooperation on the part of the nation's civic and educational authorities. It calls for greater investment of capital and brains in fire protection, particularly in the field of education and training of the nation's fire fighters. In short, it calls for bigger, better, more scientific training facilities, not merely for the big city fire fighter, but for the town, village and the crossroad fireman, if the nation's staggering fire losses are to be contained, let alone reduced.

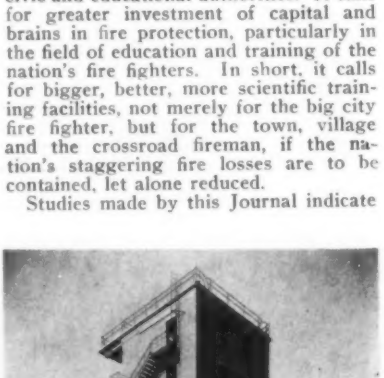
Studies made by this Journal indicate that although money is "tight" for the fire service all along the line, it is conspicuous for its absence in training and educational budgets. It seems to be the general idea of civic government that local firemen will work out their own training salvation in some way, and that any funds available for the fire department should be spent on tools and equipment, and not in revitalizing old training methods and facilities.

Room for Improvement

It is true that some improvements have been made in this essential of fire protection. It is also true, however, that the improvements have been made for the most part outside the individual local fire departments themselves, at the state and national level. Surveys by FIRE ENGINEERING indicate that although the majority of municipal fire departments are aware of the need for improving train-



Located on plot 300 x 300 feet, this $120,000 Syracuse, N. Y., drill tower is near center of city. Five stories and basement, 30 x 30 feet, brick, concrete and steel construction, it has top floor overhang, swinging windows, outside fire escape, standpipes and safety net. Fires can be ignited in basement and on first and third floors. Drill ground has 20,000-gallon cistern, and high and low pressure hydrants.



The 83-foot brick, concrete and steel tower is an important feature of the Cincinnati, Ohio, Fire Department's modernized training school installed under Chief Barney Houston. Tower has double-bank windows, wood covered sills, iron stairway type fire escape, removable roof railing, dry standpipe and sprinkler systems. A 70,000-gallon cistern is located below structure. Drill yard measures 175 feet by 150 feet, is flood-lighted and provided with hydrants. Tower adjoins three-story brick fire station (Engine 29, Ladder 2) which houses auditorium seating 225.

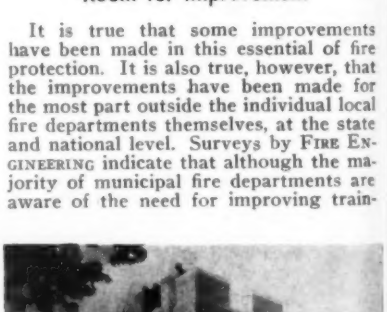
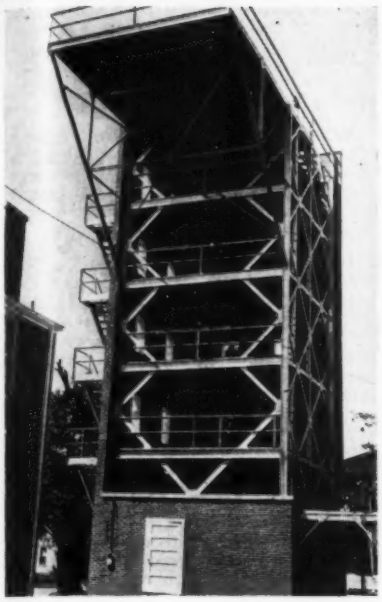


Photo courtesy Portland Cement Association

The all-concrete drill tower of the Mattoon, Ill., Fire Department is used by local and visiting firemen from a 50-mile area. The foundation and first floor is cast-in-place concrete. Upper floors are of tile-joist-concrete floor construction. Walls are of lightweight concrete masonry. It is 44 feet in height.



Steel skeleton, brick base and facing (on two sides) this Charleston, W. Va. Fire Department drill tower has smoke room, standpipe, safety net and floodlights.

Dayton has modern training tower. Brick masonry and steel, 6-story tower and attached school building, finished in 1950, has smoke room for gas mask drills; utility room for indoor training; class and assembly room; sprinkler system; standpipes; and other features. Here firemen fight simulated top floor fire.

The Detroit, Mich., training building is one of the few in the nation in which full scale aerial ladder and other drills can be conducted, under cover. Here firemen advance line to fifth floor. Note use of numerals on wall as guide in ladder placement.

ing methods and procedures, that's about as far as they have gone.

It is illuminating to review the recurring recommendations made by the National Board of Fire Underwriters to cities and towns, following their local fire surveys, that fire schools be established and equipped, with the idea of providing training in operations. It is also somewhat surprising to find the number of municipalities lacking such a fundamental as a satisfactory drill tower. As to those which have what may pass for a "training ground", the number is still too few. It is a regrettable but probably accurate conjecture, that only a few score modern drill towers have been erected since World War II, and even the number built during the decade prior to that period is hardly worth tabulating.

The net result is that the majority of individual fire departments throughout the nation either have no adequate drill tower, or are attempting to get by with ancient structures lacking many of the facilities required by fire fighters in today's operations. Too many are still utilizing makeshift drill structures that are in reality little more than platforms for ladder evolutions.

That is the dark side of the picture. There is another and happier side. That is the progress being made in state fire schools and colleges, and the determined effort being put forth by some county, and a few big city fire departments to overcome this handicap.

What Drill Towers Should Include

The National Board of Fire Underwriters has persistently advocated some form of drill tower for the training of firemen. Their Special Interest Bulletins 234, 235 and 236 say: "Instruction in the past was mainly for the rooky to teach him the fundamentals of handling hose, ladders and other equipment, but provision must be made so that companies can be trained in teamwork and the physical condition of the men can be maintained."

They go on to add: "Usually a drill tower is provided, three to six stories high, depending upon the heights of the buildings in the community. An existing building, such as a fire station or some factory, can be modified to serve as a place to drill."

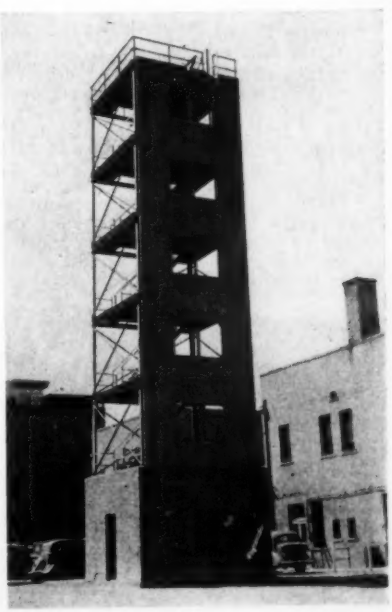
The Board suggests provisions for such a drill structure. "Uusually these," it says, "are a reproduction of a side of a building, with windows, roof eaves or cornices at the top. Ample floor space must be provided at each floor level and on the roof to permit operations simulating those which might be necessary in a building where the fire was on the upper floor."

"There should be an inside stairway, an exterior fire escape, interior standpipe, if such exist in any building in the community, and a cellar or basement, or the equivalent, in the form of a smoke room above ground. If this last is used," the Board recommends, "it should be so constructed that its use would simulate conditions in a basement," and it offers these further observations:

"Conveniences for the men must be provided, where they change their clothes, get out of the rain, and get thawed out, as it may be desirable to have some drills to show operations in severe winter weather. Toilet facilities are essential and it may be desirable to provide for meals; for this reason it is usually desirable to have the drill facilities near or at a fire station.

"There should be the usual alarm facilities of a fire station, as those men at the drill school should not be considered out of service if a second alarm occurs; the lessons to be learned at such a fire justify the interruption in the drills."

Incorporating the ideas of the National Board as well as fire chiefs and others interviewed by this Journal, the fundamentals of an adequate drill tower may be set forth as follows:



Albuquerque's six-story drill tower has a brick base with steel skeleton, faced on the climbing side. It affords protection to gear and provides smoke room on ground floor.

Location: Preferably outside the business or high value district or in heavily built up areas, particularly if smoke rooms are used, or practice fires are to be built in the structure. Many drill towers, it is true, are presently incorporated with fire department headquarters, usually in downtown areas. As these departments develop fire training

grounds, along the lines described later, the drill tower can be incorporated in the new layout and the old tower used merely for certain evolutions and demonstrations. Where the downtown drill tower is so located that it can be disposed of, some chiefs recommend getting rid of it and applying the money toward a complete training field in an outlying area.

Many cities incorporate the drill tower with their fire alarm office, or department shops, or water works, which provide the toilet and other facilities recommended by the National Board. The latest trend is to include a drill tower as a necessary unit in the complete training ground layout, either attached to the auditorium or fire station, or fire test structure, as preferred.

Experience has demonstrated that if fire suppression tactics are to be taught, consideration must be given the effects of the smoke clouds and the excitement which such evolutions precipitate upon the public. Some fire departments have had to curtail certain fire tests because of complaints by the public that they were a "nuisance."

Separate Component or Integral: The question whether the drill tower should be integral with other structures, as stated above, or an individual unit by itself depends upon local conditions and limitations. No matter where the structure is located, however, there should be related facilities immediately available.

Physical Features: For larger departments, the drill tower may be six stories, basement and roof. In smaller departments the majority do not exceed four stories. In the very smallest departments a two to three story structure is usually sufficient. It is pointed out by some chiefs, however, that even in the smaller communities there may exist buildings such as schools, institutions, grain elevators and the like in excess of three stories. These chiefs recommend a taller drill structure to better familiarize firemen with working at elevations. The height of a story may range from eight to twelve feet; the average is ten feet.

Dimensions: Measurements of width and length, likewise, vary according to type of structure and other details. For the smaller communities, width of six to ten feet square prevail; larger types run from twelve to fifteen feet, or more.

Architecture: These structures are usually designed more with an eye to utility than architectural beauty. Where it is an adjunct to, or part of, another structure, the practice has been to keep the tower design in harmony with the architecture of the related structure or structures. Although a drill tower is essentially a utility, it need not necessarily be an eyesore. The homely early metal and wooden scaffolding type towers are being replaced by closed-in construction of brick and steel or concrete, or a combination of all three.

Construction: The building naturally must be sturdy and safe. Wood, which is cheaper initially, usually costs more in the long run if the frame work is wood sheathed, and must be painted periodically. Brick over steel frame, brick and joist, or concrete, require less upkeep, are less combustible and safer from the weather.

Basement: Is highly advisable, as pointed out by the National Board, even though it materially increases cost. This should be such that smoke tests can be conducted. Basements should have provision for proper drainage and may be advantageous to equip them with sprinklers for demonstrations and training. Typical sidewalk basement openings should be provided, with suitable covers or gratings.

Roof: Should preferably be of concrete or metal, watertight, with suitable parapet or guard rail. The parapet is better because it more closely follows typical building construction. Guard rail may interfere with ladder operations. Some departments prefer to have one side of the top floor (roof) project out from the building to simulate a cornice. Others include actual cornice and parapet at least on one side of the drill structure, to give men training in using scaling ladders "over the roof."

Windows: Usually open, without glass, and have wood sill or lintel to protecting facing against damage from scaling or other ladders. Metal frames are advisable where fires may be burned in the towers.

Inside stairs: These should be provided, preferably of non-combustible material, connecting all floors. If basement is included, it should be sealed off by metal sheathed door (the one used should be similar to that in prevailing fire-safe construction in the area to familiarize men with its type and method of opening).

Outside fire escape: This is essential for teaching fire escape operations. Even if fire escapes are the exception in the small community, firemen may be well trained in fire escape work because they may have to operate on such escapes while aiding other departments on mutual aid response.

Drainage: Both building and grounds should have adequate drainage facilities. Some drill towers have floors sloping slightly toward the stairs so that all water will drain by gravity from the top to the bottom of the structure and out, either through a suitable storm drain on the first floor, or through the main doorway. Structure should be so elevated that a slight grade will carry ground water away from the building rather than toward it.

Sprinkler System: A typical complete sprinkler layout with inside or outside risers, taps on each floor, outside siamese, etc., should be installed.

Lighting: All fixtures should be weather and explosion proof. If fires are to be built within the structure appropriate fixtures should be installed. Provisions should be made for floodlighting the building and apron. There should be no exposed wires outside or inside the structure.

Heating: Unless the structure is indigenous to some other building, it need not have heating equipment of any kind. Even if so, and heat is required in any part of the drill structure, it should be piped in.

Safety Features—Nets: Every drill tower should be equipped with suitable safety net and collapsible (removable) frame which can be quickly set up on the operating side of the tower. These rope nets, preferably with latest type spring attachments, can be dismantled and stored at conclusion of drills.

Water Supply: Hydrants should be located nearby to facilitate hose operations. A drill ground should also have provision for drafting water. Modern drill grounds include a concrete "splash back" against which fire streams may be directed, and the water drained off into sewer, or to return to the pit or other static supply. This drain-off may also prove advantageous in calibrating and testing nozzles.

Fire Alarm: As previously stated, the drill tower, or an adjacent building,

Safety nets are essential in drill tower operations. This is the type of net used by Providence, R. I., Fire Department to protect men in scaling ladder evolutions (some departments prefer not to stow ladders on nets for fear of injuring personnel and/or rope work).

should be tied to the fire alarm office so that all alarms may be received. Some departments station a radio equipped car (or use their radio equipped apparatus) at the drill ground for this purpose. A number of departments have a fire alarm box at the location for use in demonstrations, tests, etc.

Apron: The approaches to the drill tower should preferably be paved to facilitate maneuvering of apparatus around the structure. It is not necessary or advisable to pave the fire training grounds where fires will be built. The latest design in training grounds calls for laying all or part of it out on paved streets with curbs, the better to train the men in field operations. The balance of the area is left unpaved.

Privacy: Privacy may be secured by fencing in the drill or training ground. In the case of the latter, where area fires may be fought, it is essential that the public be kept at a safe distance. Wire fencing permits spectators to see in safety. If fences are used, gateways should be sufficiently large to permit passage of the largest apparatus.

Storage Space: It is advisable to provide storage space in or adjacent to the drill tower for gear used in instruction and demonstrations. The drill school should have all tools and equipment normally provided on apparatus, and suitable facilities for their use. The National Board goes so far as to recommend roof sections on which practice in cutting an opening with an axe can be available. Some departments keep railroad ties, or floor sections, on hand for similar cutting instruction.

Sign: A neat placard or sign may be placed over, or at the entrance to the drill area or training ground to identify the installation.

Miscellaneous: A few pertinent suggestions of the National Board are worth including. The Board says: "The place where drills are held should have ample space around it to permit the use of apparatus as at a fire, and throwing of streams : . . it would be well to have the drill tower or other building used provided with proper drains to permit streams to be used on and in it. . . . Training in salvage work must be considered in the design, which may mean having one floor laid out with shelving or closets and provided with furniture. This may be the room provided for the comfort of men. . . . The tower or some other portion of the building should be such that the men could observe the penetration of the fire stream when thrown through a window and could understand the effect of obstructions, such as partitions, to the delivery of water to the point where an actual fire would be burning. . . . A drill tower or some other portion of the building should be sufficiently enclosed that the men could be trained in getting rid of smoke from an actual fire through opening skylights and windows. . . . One of the most important drill functions is in training the operators in the handling of pumps and raising of aerial ladders. . . . Use of ladder pipes, fixed and portable turret nozzles, cellar pipes and distributors can be carried out at the same time men are given instruction in operation.

The National Board further believes there must be rooms of concrete, lined with hard burned brick, in which fires can be built and men trained in the proper approach and technique. The ideal, it states, would be a building of several stories and basement, where the various evolutions, including the freeing of smoke and heat, can be carried out. Only the larger cities can afford such a structure, the Board admits, but it believes the states should interest themselves in the erection of such building where fire departments in the state can be trained in actual fire fighting.

This leads directly into the question of practical field training and learning-by-doing.

Navy Inspired Training-by-Doing

The Armed Forces in their training programs simulate combat conditions, using live ammunition to give the new recruit a taste of battle before meeting the enemy. In line with this practice, the Army and Navy and Air Force fire schools simulated fire combat conditions with real fire.

This training reached its zenith with the advent of the regional fire fighting schools of the Navy, established during the World War II period by then Lieut. Commander Harold Burke (later Captain USNR and Chief of the New York Fire Department). Students of naval operations during that War credit the "fire damage control battle training" of naval officers and seamen with preventing catastrophic losses to aircraft carriers and other craft during enemy attacks.

Although most of these Fire Fighters' Schools are no longer maintained, the few that are serve as training fields for visiting municipal firemen. More than this, the personnel who taught and learned firemanship under actual "battle conditions" during the War have carried the theory and practice of this form of training into all parts of the country. Many ex-service men so trained are now serving as instructors in our fire schools and colleges; many are now officers of municipal fire departments.

Although the Federal Government has reduced budgets of the Armed Forces, with consequent reduction in these training facilities, there remain numerous Federal installations which still cooperate with the nation's municipal fire forces. The Air Forces maintain a nationwide organization of aircraft crash firefighters, well organized, trained and equipped. Many of these installations cooperate with nearby municipal firemen to train members of the latter in fire suppression and rescue, as related to planes and transports. Many chiefs of these airbase and other installations assist as lecturers and instructors in the training of paid and volunteer firemen. Of course this cooperative service must be secured "through channels."

Municipalities Adopt Navy Tactics

There were certain efforts to develop firemanship "training by doing" long before the Armed Forces found it expedient to give its personnel "battle practice." The forerunner of the municipal fire training grounds, per se, is said to be that established by the late Fire Chief Selden Allen in Brookline, Mass., in 1939 (described in FIRE ENGINEERING, September, 1939).

It is believed this was the first municipal fire school which combined drill tower, fire station, and other facilities for actual extinguishment of fires, in this country. The site was selected for its isolation. The fire station and drill tower (individual units) were of fireproof construction. Three acres were given over to the fire department for the site, the drill yard being triangular in shape, 210 feet by 178 feet, entirely circled by a chain fence. The buildings skirt the drill yard, the drill tower being set sufficiently apart to permit fire apparatus to maneuver about it.

The facilities included platforms for cellar pipes and distributors; a 30,000 gallon underground concrete water tank for drafting and testing engines; yard hydrants; a smoke house to demonstrate ventilation; a storage building (50 ft. x 10 ft. x 12 ft. high); six story drill tower with all connections and fittings; paved drill yard; safety net, etc. The entire establishment cost at that time $132,000.

Prior to this far-sighted installation, most attempts at actual fire extinguishment demonstrations (they could hardly be called training) were in the form of

Built in 1948, the Dallas, Tex., training ground is located in park-like area in secluded part of city, with unlimited water supply. This open construction steel and concrete tower (70 feet over-all) has inside stairway; outside fire escape, standpipe and other features. Its location allows practical fire extinguishment and fire control training, ladder and hose evolutions, etc.

Demonstrating oil fire extinguishment by agitation at New Haven. Air is piped under pressure from the department's air compressor unit into deep concrete pit containing burning fuel oil, to quickly knock down the blaze. Some spectators are standing on training ground smoke house roof. Note shallow test pit in foreground.

Solvents are sprayed over 1,000-gallon railroad tank car mounted over pit which is filled with solvents. This New Haven Training Ground tank has survived hundreds of fires which were extinguished with every known type extinguishing agent.

Corner of New Haven Auditorium which can seat and feed over 600 persons. Structure was built by fire department members with State financial aid, using reclaimed materials. Photo shows main entrance of drive-through.

experiments conducted by individual fire departments somewhat along the ideas of exhibitions staged by manufacturers and distributors of fire extinguishers and apparatus. Mass interest in fire evolutions was created by the national tournaments of the fire service, the first of which was held in Chicago before 130,000 excited persons on Sept. 5-6, 1937. This was purely for public edification and not intended as a training exercise for firemen themselves.

There were sporadic attempts to develop practical field training, largely by state fire schools, in the late "30's". One of the staunchest advocates of learning fire fighting by actually putting out fires was the late Chief J. Ray Pence, of the Stillwater Fire Department, at Oklahoma Agricultural and Mechanical College. Chief Pence established one of the first completely equipped state training schools, with laboratories, lecture halls and classrooms for students in the firemanship training course at the university. Students were quartered at the college fire station and fire headquarters, and served as members of the fire department while taking the course.

The late Chief Sherwood Brockwell was another advocate of practical field training in fire control. He advocated this type of training-by-doing, but it was not until the Armed Forces and the Navy, in particular, had demonstrated what could be done with such training that state schools began to seek funds to create such training grounds.

Their appeals increased as the knowledge of the New Haven Technical Training Ground spread throughout the country. Firemen of the State of Connecticut, which had long sought to develop its firemen's training school, were fortunate in having the facilities of the New Haven made available to them. This Training Ground became the Mecca for literally thousands of New England and other fire fighters who look to it yearly as the place to witness what's newest and unusual in the field of fire extinguishment, apparatus and equipment.

With the New Haven, and the Navy examples before them, the States of Maryland, Iowa, Florida, Pennsylvania, New York, Indiana, West Virginia and others either have installed such facilities, or are planning to do so.

The New Haven Technical Training Ground

No study of modern firemanship training would be complete without a description of the New Haven Technical Training Ground, as it is called.

As Chief Paul Heinz says, like most endeavors of its kind, this just grew, like Topsy, in *Uncle Tom's Cabin*. It was an idea, taken from the Navy's experience and elaborated on from year to year, as the need and the resources developed.

The work first started on the Grounds in June of 1944. A parcel of city owned land, approximately 400 x 200 feet was obtained. The lot was located next to a slip of salt water, which has since been filled in to make an elevated throughway which will skirt the property. However, bay water for drafting is available about 1,000 feet distant.

The land was anything but prepossessing, but members of the department, working on city time, pitched in, aided

by the Public Works and other city departments, and soon had it leveled out, and the first of the field structures and test facilities were installed. Most of these came from various contributors. Used car and junk yard dealers, local manufacturers and others responded to Chief Heinz's every appeal. An appropriation of $500 was allowed by the department for building materials and labor costs to erect cinder block building known as the "gas chamber."

Various types of tanks, some built of metal, others of concrete, including open type, above-ground elevated tanks, fitted with perforated supply lines connected to storages of fuel oils and other flammables, were found and installed on the Grounds. The New Haven Railroad cooperated to erect the equipment for demonstrating the electrical conductivity of water, fog, and fire streams. This does not include the very latest fog towers, the manifold, and certain other adjuncts installed last spring.

In 1949 the State of Connecticut appropriated the sum of $65,000 toward the erection of the large auditorium at the New Haven grounds. The completed structure would have cost several times that amount had not firemen done most of the building. This concrete building, with its heavy roof trusses (salvaged from a nearby abandoned wharf) has a large stage, an auditorium that will seat 600 persons, a kitchen that will feed that number, and more, all necessary toilet facilities, an office, a large library and a companion meeting room. The building is equipped for motion pictures and contains all necessary visual and other educational features, including P. A. system, a complete and functioning "watch desk" with teletype, radio and wire instruments.

Perhaps the most used structures are the 2½-story and basement fire training building and adjoining smoke house. In addition, there is an office which is the field communications center, a concrete block storage building, and a modern five-story concrete and steel drill tower.

All-year-round training is now undertaken as desired, at the Training Grounds. All New Haven firemen are schooled here in every phase of firemanship—as are visiting fire fighters without number who attend class (by invitation).

Among those who aided Chief Heinz to plan and build this enterprise are Assistant Chief Thomas Collins, Battalion Chief Andy Flanagan and Captains Kaiser and Welsh.

Rochester Plans Vast Undertaking

The Rochester, N. Y., Fire Department has begun an undertaking that will, it is said, provide it with a training and proving grounds second to none. Every means of modern firemanship training will be provided by the City's new Fire and Police Academy and Training and Proving Grounds on Scottsville Rd.

The city has appropriated $450,000; bids have been received, and some contracts let, it is reported. The site includes a section of a 6,000 foot strip of land along the Genesee River, owned by the city and extending back to it from Scottsville Rd. and a 276-foot wide plot of land purchased by the city. The proving and training section, at the far eastern end of the property, will include areas for practical training in the fighting of various types of fires; a five-story training tower, and a two-story concrete block house in which will be built actual fires.

The grounds will also house a large two-story repair shop, fire and police telegraph, with engineering shops on the ground floor and classrooms and offices on the upper floor. Facilities for pressure gauge testing of city department pumpers will be provided in the repair shops. Water for the tests will be drawn from the river and returned to that stream when used. There will be a boiler room and power house and it is expected also to construct a large auditorium and a new resident firehouse. The latter will house a latest type pumper which will offer better protection to the City Airport and the southwest section of the city.

Fire Chief John Slattery, aided by Deputy Chief Foos and others of his organization, have long been active in promoting broader firemanship training. Chief Foos and his brother who is also an officer in the department, have been active in the development of the New York State training program, widely publicized throughout the nation.

Baltimore County Plans Elaborate Program

If present plans materialize, the Baltimore County, Md., Fire Department will have one of the most elaborate combinations of training and other facilities in the nation. It is planned to consolidate in a single conveniently located area near the fire department headquarters, a fire prevention bureau; repair shop; fire alarm headquarters, including radio system center and fire station and training school. The consolidation will simplify administration and eliminate waste motion, time and money, it is said. Under the present setup, the various divisions of the department are scattered over a wide area.

Baltimore County has a population of over 300,000; covers approximately 615 square miles. The paid department has nine fire stations, comprising thirteen engine and one ladder companies. Paid personnel is presently 204 but additional new stations will bring this to 250.

The volunteer fire service of the County is comprised of 27 fire stations, 62 pieces of apparatus, and a total personnel of about 3500 members. The two services, paid and volunteer, are bound together into an efficient fire-fighting force, operating together as a team on the fire ground.

In addition to other improvements, the National Board of Fire Underwriters has recommended a firemen's training school for the County. This is expected to have a modern drill tower with safety net; a structure for extinguishing practice fires and training in ventilation, forcible entry and other phases of firemanship; a gas-chamber building for training with respiratory protective equipment; numerous pits, etc., for small-fire field training.

It will include all other items requisite for well-rounded instruction in all fields of fire suppression and prevention, such as high tension electric line; small and large smoke houses; equipment storage building; cistern; drafting tank; fuel control building; fuel storage tanks (buried); three plain pits; a tank car pit (railroad tanker); pipe line pit; stack pit; electric motor pit; oil burner pit; transformer pit; "Xmas Tree"; paint spray building; and other facilities.

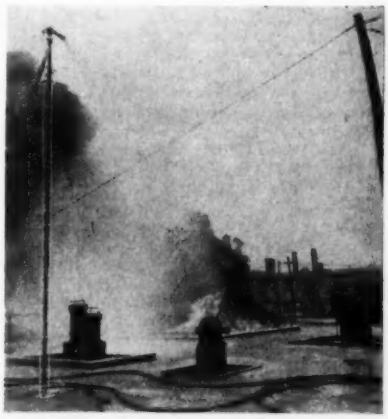
There will be ample fire hydrants throughout the area, and the fire station is designed to house three pumpers (one spare), an ambulance, a utility truck, an aerial ladder and an additional future truck or an ambulance.

The plans for this elaborate set-up have been prepared under direction of Paul J. Grubb, architect of the Department of Public Works.

Training by Doing Needs No Elaborate Training Ground

Although the completely equipped and staffed training and drill grounds such as we have described are the ultimate

One of the few drill towers in which actual fires are touched off and extinguished by various means, including piped dry chemical, is that of the New Haven, Conn., Fire Department. Here firemen advance fire escape line under direction of Battalion Chief Flanagan, using powered megaphone. Net has been slackened off for drying. Note deluge tower in foreground used in experiments with 500 and 1000 GPM fog heads.



Tall pipe standards, simulating water towers, discharging 1000 GPM beat down hot solvent pit fire. Note other training units of New Haven Training Ground, left to right, transformer pit, motor pit, corner of railroad tank and guy pole for electrical conductivity test equipment.

Dedicated in 1952, this modern training plant at Ridge avenue and Cinnaminson street, Philadelphia, Pa., has fully equipped five-story masonry drill tower and adjoining auditorium and fire station (Engine 25, Ladder 7). Large paved training yard permits ample hose and ladder evolutions.

aim of every progressive fire department, it isn't necessary to postpone all field fire training until that Utopia arrives. In other words, you may not be able to afford a Cadillac right now, but you can go places with a Ford.

Last April FIRE ENGINEERING told the interesting story about the Stephens, Ark., Fire Department and its enterprising skipper, Chief Chas. Reveley, and how, realizing the importance of training and practice—not altogether of the blackboard variety, but experience in fire fighting, the young organization decided it had to have a drill ground. How these enterprising volunteers converted a plot 60 x 240 ft., adjacent to their fire station which was leased to them "for life" by cooperative citizens, into a simple but effective training ground is a saga of the nation's volunteer service. It can be duplicated wherever firemen want things hard enough to go after them.

The 2-story frame drill tower erected out of lumber from an old barn, the gift of another citizen, would take no prize in an architectural show, but it served the needs of the department, and of the visiting organizations that come from Southern Arkansas to make use of the Stephens' drill ground. It measures 12 ft. square by 32 ft. to the ridge. It has an inside stairway and attic with peaked roof, capped so ventilation can be demonstrated by using actual fires in the combustible tower. The total cost for lumber, paint, roofing, etc., was less than $100!

The training ground also boasts a "Christmas Tree," an oil-spill tank and earthen pits for oil fires, and other facilities, most of the material donated and all of it used to give Stephens firemen actual fire extinguishing experience. And this is only the beginning for this "big little" department.

Since the story of Stephens was spread throughout the world in FIRE ENGINEERING it is encouraging to note that numerous other small volunteer fire departments have set out to create their own drill grounds.

But there is still another excellent way to gain most of the benefits of learning-by-doing in fire extinguishment, even if it isn't possible to have a permanent New Haven Technical Training Ground. It needn't cost much, and it calls for only determination. Money is secondary in this enterprise.

We refer to the "Firemen's Training Institute," two of which have been held by the fire fighters of Westchester, N. Y., under sponsorship of the Fire Chiefs' Emergency Plan of that County.

In both, the idea was to utilize existing facilities for inside lecture work and outside field fire extinguishment. The classroom work consisted of instruction by leading lecturers of the fire service in the largest available school auditorium in White Plains, N. Y. Enrollment for the two Institutes exceeded 2,200 for the classroom sessions and 4,000 for the all-day-Saturday fire field operations.

What this one county accomplished can be duplicated anywhere, if the effort and cooperation are there. The pits need not be so large; less fuel oil and volatiles may be burned; the demonstration devices such as transformers, paint lockers, etc., need not be so elaborate, and there need not be specially built complete wooden shacks to prove the efficacy of fog and wet water; more modest set-ups will do just as well. And its a poor department that can't dig up a wrecked jalopy, or even an old tanker or other rig, that can be used to simulate the highway fire. Every community has some land available for this outdoor training, and there is some sort of auditorium or armory, or like place in every community that will serve as a meeting hall. Furthermore, there are state and county organizations, like insurance rating boards, firemen's associations, ready to lend a hand. Instructors are available in most states to help with the classroom educational program, secure lecturers and issue certificates.

Industrial Training Grounds

Among the major industries, at least, private plant fire fighters are outstanding for efficiency, and for their fire control facilities. This efficiency is largely the result of training. Many industries employ highly complicated, and frequently dangerous materials and processes with which plant fire fighters must be familiar. In many cases there is only one way in which to train industrial firemen to cope with the special fire suppression problems posed by these particular hazards. That is to train them "by doing the job."

In many cases this training can be accomplished in some part of the plant itself, but generally it is done out in the open, or in a specially designed structure or other set-up, located on plant property.

In a few instances this plant training school or division of the industrial company serves also to help train (by doing) municipal firemen, safety engineers and other outsiders who may also be concerned with the special hazards encountered in the particular manufacturing plant.

A single example of this type of progressive industrial fire training ground will suffice to illustrate the point. For the purpose, we take the Consolidated Edison Fire School in the Astoria, Queens, plant of the Con. Edison Co. gas, electric and steam), the director of which is W. E. Rossnagel, safety engineer of the corporation, and known to FIRE ENGINEERING readers for his series of articles on industrial fire protection published in this journal.

The School, now in its sixth year, is designed primarily for training the System's supervisors, foremen, watch engineers, fire brigade members, and the rank-and-file operating employees, in the prevention and extinguishment of fires of the types which might be expected to occur in any of the company's power houses, substations, gas plants, garages, storehouses, etc.

The course has recently been expanded to include two 3-hour classes and one 2-hour class. Classes are held during spring and summer months.

Primary classes include lectures on first aid fire fighting appliances, after which students all have an opportunity to use the extinguishers on actual fires of all types.

The company believes that no school would be complete without students combating some indoor as well as out-of-door fires. For this purpose a smoke house 15 ft. x 30 ft. by 10 ft. high was built of ordinary wood frame with wire lath instead of lime plaster; the building and the interior partitions are coated with fire resisting Vermiculite plaster. Although over 400 big oil fires have been built in this structure, there is not a crack in the plaster.

Inside the rear of the building, behind a ceiling high partition, are several simulated high-tension electrical compartments containing reactors and transformers, and intended to represent an electrical substation. Transit oil (which is used in transformers and circuit breakers) is pumped into one of the compartments and allowed to run onto the floor and form a puddle about 10 ft. square in area. When ignited, this makes a very hot, smoky and unapproachable fire.

Men are taught the use of the special fog nozzles and applicators used by the System. After a refresher course on gas masks, they are made to don the masks and fight fires with pressurized vaporizing liquid extinguishers. Students are also coached in fighting fires in magnesium and other metallic turnings.

The advanced classes, held on Thursdays, are open to those who have previously attended the primary class. Supervisors and Fire Brigade members are all expected to take this advanced training. There are lectures on the fundamental theory of fire fighting, control of different types of vapor fires, etc. Instruction is also given in the use of high velocity fog, low velocity applicators, and of fire department equipment

(*Continued on page* 856)

Financing—The Major Problem Facing Volunteer Service

Despite Handicaps of New Laws, Public Apathy and Rising Costs, the Volunteers Are Doing Well

By ROI B. WOOLLEY

Editor's Note: **Each year at this time the editors of Fire Engineering review developments in the volunteer as well as the professional municipal fire services; add up the gains and losses and project the whole against the coming twelve months. From this study it is apparent that the most pressing problem facing the volunteers is the same as that which plagues the paid fire service, e.g., money. Money may be "the root of all evil," but it certainly is the root, trunk and branches of all fire services.**

The editors therefore, commissioned the author to prepare a brief report on the situation with a view to bringing our readers up to date on conditions, the better to enable those in the volunteer field to shape their own departmental financing for the months to come.

Except in cases where quotes are necessary, names of persons, organizations and locations have been omitted. The author, however, acknowledges the assistance of the various Divisions of the International Association of Fire Chiefs; the Bureau of Fire, Division of Safety, New York State; the National Board of Fire Underwriters and the National Fire Protection Association, and the several State and County Volunteer firemen's associations which have contributed to this effort.

THERE are over 14,000 volunteer fire departments in this country. Nobody knows just how many because the number is increasing at the rate of several every week. And it is rare indeed to hear of a volunteer fire department, once organized, going out of existence.

Nobody knows also, the investment in real estate, apparatus and equipment maintained and operated by these departments, both those which are self-supporting and those which are financed partially or in whole by the political sub-divisions they serve. Nor is it easy to assay the financial status of volunteer organizations in terms of cash-on-hand, and net negotiable worth. Generally speaking, however, it is safe to say the nation's volunteer fire services are solvent and in many parts of the country are doing right well by themselves, as well as their communities.

When Associations Prosper

Some indication of the worth of these organizations may be had by the financial reports issued by the state and regional volunteer firemen's associations. Most of these show considerable assets and so doing, they reflect the financial status of the individual member fire departments in the group. The published financial statements of some of these associations read like those of the nation's great banking and investment houses. And be it said here that those assets are not all accumulated for pleasure and political purposes but for the betterment of the volunteer fire service, and better protection for the public it serves.

But this is not intended to be a study of volunteer associations, how they are financed and how they use their funds; the point is stressed however, that they are a good index of the financial strength of the countless individual volunteer fire companies which dot the nation.

These associations, by virtue of their membership of volunteer departments in all categories, city, village, town and district, provide a fairly accurate yardstick by which to measure the worth of the volunteer service, geographically. It is logical to assume that those states with the largest populations, having the greatest number of incorporated towns and villages, should have the largest number of volunteer departments, and consequently be able to draw upon a larger and wealthier reservoir for their financial support. By the same token, their cost of doing business is greater than that experienced by the smaller, less pretentious departments.

Financial worth, however, is not always related to size of department. There are a number of large fire organizations, with ancient names, which are today having difficulty making both ends meet; and there are many small town, and even crossroad departments (actually some of them are companies), whose financial worth would shame organizations many times their size.

Why is it that one group prospers while another is poor? Why can one department continue to build up its treasury, in the face of obstacles to money raising while another, will go broke? The answers to this and related questions are developed as this study progresses.

Getting Off to a Good Start

A contributing factor to financial success of a volunteer department—and without financial success let's admit there can be little other success—is the basis upon which it was organized, and is administered. In the past it was true that any group of active, public-spirited American citizens of voting age, for whatever reason, either to satisfy their interest in community welfare or to spice their life with "alarms and excursions," could form a volunteer fire company. Sometimes they elected a chief and other officers before the business of raising money for apparatus and fire house was begun. Ultimately, how-

One way to sell tickets to firemen's ball. Driving this pint size engine is a fireman who is promoting the annual ball of the fire department. It is powered by a tiny gas engine of the lawn mower variety, and carries, besides garden hose, regulation fire hose, extinguishers, small ladders and, naturally, a helmet.

ever, the spectre of funds required reared its ugly head. And here is where some organizations got off on the wrong financial foot. It was not unusual for persons or firms to assume obligations in the excitement of launching the enterprise which were later regretted. Generally, however, where there was genuine local interest, there were few financial repercussions. The difficulties more often came after the company was "in business," and when it desired to branch out and expand its facilities and services. Whereas public spirited citizens, and the volunteers, at the beginning, accepted obligations of labor, and financial aid, it wasn't so easy to later repeat solicitations.

As one Chief expressed it "the trouble with so many volunteer outfits is they've got a champagne appetite and a beer income. Too often they always want the biggest and the best, which means the costliest. They can't be satisfied with anything less than the other fellow has, and would rather have something better. It must be a 1,000-GPM pumper, even if nobody knows where the water for it is coming from."

Thus, the volunteer fire service has suffered no less than certain citizens, from the keeping-up-with-the-Jones' fallacy. Recent surveys of financial responsibilities of volunteer fire companies, the author is glad to say, show that this failing is today more the exception than the rule than as it was some years back.

The financial success or failure of the volunteer organization may also be said to depend upon the principles of financing laid down by its founders, and incorporated in its charter, its constitution and by-laws. In general, volunteer fire groups are made up of men from all walks of life. Included are men in business, trades and professions. Many of these men run business of one kind or another. They know the fundamentals of financing an enterprise. And yet, collectively, they have been known to accept, even endorse, a policy of departmental spending which they know will leave the department treasury flat. This situation usually develops some time after the founding of the company and is often encouraged by newcomer members who suffered no labor and no money-raising headaches in the early development period of the outfit.

"We've got the money: we earned it —what are we going to do with it— leave it rot in the bank?" is the attitude of some of these spenders.

Pick Businessmen for Financeering

Another hurdle which affects the financial affairs of most volunteer companies, particularly those which do not have rigid administrative regulations, is "change." Almost yearly there is a turnover in officers of most volunteer companies, with the possible exception of secretary and in some cases, the treasurer who often carry over, but who also, can be out-voted. Today's governing body, which builds up a nice financial reserve for the company, or department, may see all that dissipated under next year's careless administration. This was illustrated during the financial crash of the early 30's. Many well-to-do volunteer fire companies lost all or most of their bank holdings because of bad financial management. Others, which acted upon considered judgement of financial committees of business men, were able to maintain assets. The moral would seem to be that if you have businessmen in the organization, pick on one who knows the value of money for your treasurer, and have a finance committee that will put spending as well as investments under the microscope. "Bear this in mind," said a tough treasurer of a prosperous New Jersey department: "It's hard enough to come-by money these days, but it's harder trying to keep it. On one hand you've got the spenders who always want another rig, or a wing to the firehouse, or a swimming pool, or whatnot; on the other, you've got the problems of investing what you get— and most volunteer fire departments have a pretty tough time salting their money away, where it will pay the most return."

Higher Costs Must Be Faced

Now we come to perhaps the most serious obstacle to successful volunteer fire department financing. That is the increased costs of doing business.

It doesn't matter where the revenue comes from, or the amount. The simple fact is that the dollar doesn't buy any more fire apparatus or equipment, or materials for fire houses, than it does groceries or other necessities. This painful fact has its impact on the good city fathers who support in part or in whole the volunteer fire forces.

In the early infancy of a volunteer fire organization, we have said there is a willingness for citizens and volunteers to assume obligations, make sacrifices, anything to get started. The lads turn to and erect their own fire station; contractors and others knocking off profit or donating material and money. That's fine. But after the mortgage has been burned, let's say, comes the call for further improvements: a standard pumper to replace that converted jalopy; a kitchen in the fire house, and so on. Then comes the awakening. All of which adds to the woes of financing today's volunteer fire forces. It is no balm for the volunteers to know that the same h.c. of l. is giving their professional brothers nightmares.

The author asked the chief of a small but active and well financed department of a midwestern city what can be done under conditions like this. "How have you fellows financed that new three-way radio you've just installed?" was the question.

The chief replied: "I don't see that our problem is any different from that of the business man who must finance improvements in his factory or store. It's largely a case of selling. The greater the sales resistance, the greater must be your efforts. We just have to go out more vigorously after the money than we used to. When we stage a carnival (this department has conducted a yearly carnival, from which it derives most of its major income), we try to make it twice as big; we spend more money and effort in promotion; we pile on more promotional coal, build up more sales steam, and make everybody in the organization put out that extra pound of work."

Good financing doesn't always mean taking in more money. Greater income, as has been said, doesn't always contribute to greater financial stability unless the assets are kept unencumbered. Good financing means cutting spending corners as well. The volunteer department that is partially or fully supported by its local government soon finds out the need of economy all along the line. Fire department budgets, no less than all other municipal expenditures, are being scrutinized and skinned as never before. "It's really something to get an appropriation for any new equipment these days" said an eastern Chief who is known for his ability to sell his selectmen on improvements.

To meet this financial hurdle, this particular department has enlisted all the business and professional brains it can secure, not only in the department, but in the area served. Is it a legal matter? A legal committee, headed by a local legal shining light, gives the volunteers free advice on important questions. Is it a promotional campaign, for the good of the Village (and indirectly for the good of the fire department)? Several committees, each staffed with local business, civic and other leaders, each directing one phase of a campaign,

The sale of fireworks by volunteer fire companies is a thing of the past.

planned by still another group of outstanding persons handle the job. Not all of these people were members of the department, but when the fire council went to each of them with a definite proposal for help, in line with that person's own calling and ability, very few declined to serve. "Just the names of the folks behind the campaign," said the chief, "was enough to guarantee our making our quota."

Summing up: it appears that to overcome the increased cost of doing business, it is necessary to increase the promotional effort. If money is tight in one place, it usually is in another, which leads to still another financial "detour" to slow down the volunteer financial progress!

Has the Public "Cooled" to Vamps?

That is public apathy, disinterest, and in some casses, open disapproval of the volunteers.

At some time in its existence, nearly every local fire department comes under disapprobation of the home folks. It doesn't matter just what the reason might be, such public attitude usually signs the death warrant to any kind of departmental promotional scheme, including that of financing of projects, and even of maintaining the organization in the extent to which it has been accustomed.

In a majority of cases where the volunteer departments were replaced by paid departments, it was not necessarily due to finances alone but to public disapproval and disagreement over policies and practices of the volunteers. There is no question but what it is economy to maintain a volunteer rather than fully-paid department under certain conditions. Usually the replacement comes more gradually, beginning with paid drivers or chauffeurs, then a part-paid organization, with the volunteers gradually losing interest and dropping out of most active participation.

A fire chief, who should know, reported that in his opinion the replacement of volunteers by regular professional full-time paid fire fighters would ultimately occur in practically every municipality where, regardless of the cost to maintain the department, the fire department failed to live up to its obligations of service. One of the causes of disinterest, if not disapproval of volunteers, has been the too-frequent and too-forceful campaigns for raising funds. Constant drives, especially for money for projects which will have no direct benefit to the public, may gradually produce a public apathy toward all efforts of the volunteers, to solicit funds. It goes further: such persistent tactics tend to alienate the business men and other taxpayers toward all that the department does and may want to do.

Earlier we said that the financially successful fire department was usually one that entered into local affairs and participated in all things for the public good. Such participation goes a long way to leaven the sourness of repeated money-raising programs. Without such participation, public recognition and approval of the fire department and its objectives is apt to be missing and so will be financial support.

This Journal's study indicates that best results in public contributions as well as approval of the department's policies and plans come from a single, well-laid out and executed money-raising enterprise. It may be a carnival, a series of dances or entertainments, or some other of the fund raising plans listed later, but it must be free of taint of any kind, and it must give the public something for their investment. The word "investment" is used advisedly.

Another well-accepted procedure is to make one mail, or personal solicitation for funds annually in outright appeal for improvements, and at another time to conduct the fair, exhibit or carnival.

One all-too-prevalent custom which brought the volunteers into particular disrepute in many parts of the country, and which fortunately is on the way out, is the "pressure ticket selling racket." The whole subject has been weighed sufficiently in the public press to require no elaboration here. Suffice to say that this annoying practice cannot be laid alone at the volunteers' doors; it has been, and is still practiced by salaried, uniformed firemen. Handmaiden to this pressure-solicitation of funds is the equally distasteful policy of mailing out books of chances on raffles. There may be some excuse for a fire department adopting such selling tactics amongst its own members, but many persons condemn the practice when unwanted and uncalled for coupons or tickets are sent to prospects indiscriminately.

Bingo, Booze and One-Armed Bandits

In many parts of the country, the game of bingo has been the most lucrative money raiser for the volunteer firemen, as it has for other fraternal and even religious groups. In the States of Connecticut and New Jersey, for example, the practice became so prevalent that appeals were made to the legislature to outlaw bingo and similar games of chance. The battle that followed in both these states (and is still being waged) was a classic. In most of these fracases the fire service took an active part, because elimination of bingo means the severance of a very profitable source of income.

Notwithstanding the fact that firemen had support from almost all fraternal, social and some religious groups, bingo got the bumps. But not satisfied, some volunteer organizations sought test cases which involved not only bingo, but the use of wheels and games of chance at county fairs. Last June, in such a test case, an indictment was voted against a New Jersey volunteer fire company by a county grand jury on charges that firemen maintained a gambling place in connection with a charity fair held as a test case. At the same time, the grand jury gave a presentment to a superior court judge saying that there were many inequities in the present law. The firemen were indicted as a corporation, the maximum penalty being a $5,000 fine.

The judge before whom the case was tried, in an earlier special charge to the grand jury that the company's firemen's fair, which almost broke up in a riot a few nights before when a prosecutor moved in with policemen to halt operations, had presented "most flagrant violation of our gambling laws." "The eyes of the state and even of the nation are now focussed upon you who initiate the movements of the wheels of justice," he said and told the jury "I know you will perform your duties with the courage and conviction demonstrated by the official who stopped this atrocious exhibition . . . a small group fortified with enthusiasm and spirit, sought to deliberately violate our laws. In so doing they jeopardized the very lives of many, including women and children." The volunteers had to retire, defeated from the "battle of bingo."

In Connecticut, the protests were handled in a decorus, but nonetheless decided, manner. Firemen of one fairly large city expressed their displeasure at government officials who had opposed the petitions to permit the continuance of bingo. The struggle in that state apparently is not ended as the loss of revenue derived from this and kindred games of chance is assuming serious proportions. A number of volunteer departments have served notice on their local or township governments that if they are to continue to render service to the public, they must have financial support of the taxpayers.

While bingo was taking a beating in these states, the question of the "one-armed-bandits" and intoxicating liquors were having an airing elsewhere. In the State of Pennsylvania which, incidentally, has the largest number of volunteer firemen of any state in the nation and which probably has more well-fixed organizations than any other, the long-drawn-out-battle to ostracize the slot machine and sale of liquor on fire department premises come under scrutiny. But that hasn't meant the end of either the sales of intoxicants, or of the one-armed-bandits, so it is reported, at least in company owned premises of fire organizations in some of the larger cities still supporting volunteers.

The author is reminded of the comments of a "visiting fireman" upon the occasion of his first trip to one of the more elaborate of the company fire stations in a certain Pennsylvania city. After being dutifully checked in at the fire house, one evening, he was ushered to the second floor where he found himself in a large room, at one end of which was an imposing bar, and at the other end a dance stage with small orchestra playing popular dance music, while a score or more of youngsters, mostly teen-agers, danced or sat at tables sipping—cokes. Around the sides of the room, part way, were ranged rows of the slot machines, before nearly every one of which stood an intent adult alternately feeding the maw of the "bandit" and yanking its lever.

The visitor appeared a bit shocked at this seeming "hive of iniquity," but his host told him to take another look. "Do you see any of those youngsters playing the machines? Or any one of them drinking liquor? Or any misbehaving on the dance floor? You don't—and you won't. Those kids are children of our company members. They are here strictly in accordance with rigid company rules and regulations. They have their end of this big recreation room; we grownups have the other" and the guide added: "I warn you, the machines are here for suckers like yourself. They are set to pay the company a profit. You can't win all the time. Now go ahead at your own risk—we can use the money."

Pondering this incident a little further, the visiting fireman said, "you know, maybe that set up isn't so bad after all. It seems to me I would rather have my children in a private company lounge like that, under supervision of parents of most of the kids, than out on the streets, Lord knows where."

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Today's Equipment and Methods Include Much From The Past

By WALTER W. STEPHEN
Chief, Fire Dept., Monsanto Chemical Company, Anniston, Alabama

THE operation of a fire department in this day and time is very much a science and a specialized branch of engineering; and a large proportion of the types of apparatus and methods of operation used seem, at first thought, to be products of modern development.

It is therefore somewhat surprising to find that a number of these types and methods that seem a part of the up-to-date and streamlined present are things that men in the fire business employed and did a long time ago.

The following are four examples:

1. Ladders more than fifty feet long were expertly operated in making rescues from tall buildings more than one hundred years ago.

2. Professional salvage corps worked with paid fire departments more than one hundred years ago.

3. Pumpers went to fires under their own power more than three quarters of a century in the past.

4. Leader lines of 1½-inch hose, connected to controlling nozzle tips or siamese connections on 2½-inch hose, were in use at fires more than fifty years ago, and, indeed some years before 1900.

Example 1. A book in the possession of the writer describes in detail much about the operation of the fire service in the great city of London during the early eighteen-fifties.

The units of this brigade were composed of men who were employed on a full-paid basis and who, from time to time, attended training schools and classes. The groups worked together seemingly without the harmful rivalry between companies that existed in contemporary American volunteer fire-fighting organizations.

They had mostly hand-pumping engines that were drawn by horses. The labor for pumping these machines, if they were operated more than a few minutes, was obtained by hiring, at each fire, men from among the spectators who worked for a shilling an hour.

The London fire service, then, does not seem to have had any ladder trucks, although there are indications that short ladders were carried, with other items of equipment, on the horse-drawn engine and hose units.

They did, however, have a number of long ladders that were often used for life-saving purposes, for people in London at that time worked and lived in many buildings that were more than three stories in height.

These ladders were of the extension type, some of them with a total length of sixty feet or more and were known as "escapes," much like similar pieces of equipment that are to be seen today in photographs of English fire apparatus.

Instead of being carried on trucks or other wheeled units as they are now, they were distributed over the city of London and kept ready for use out-of-doors, leaning up against buildings at strategic locations.

They were in charge of supervisors known as "conductors," one of whom seemed to be at all times stationed at each ladder, using a small structure like a sentrybox for a shelter during inclement weather.

Alarms of fire from places in the district covered by the ladder were brought by persons running or riding horse-drawn vehicles.

The ladder, when an alarm was received, was moved by hand to the fire, being rolled along by means of a pair of wheels on an axle mounted near its base.

The wheels, at the fire, were blocked and the ladder was raised by the leverage of a pole that projected, at a right angle, from its base. The fly was then extended by pulling on a rope. Mention is made of "tormenters," presumably for supporting ladders.

These "conductors" were employed by the Society for the Protection of Life from Fire, an organization associated with the London Fire Engine Establishment, or regular brigade, and many of them made daring and spectacular rescues of persons trapped on upper floors.

A specific case is mentioned of one of them, named Samuel Wood, in which he entered a third-story window and came out holding a senseless woman in one of his arms and a small baby with its dress in his teeth, taking them down to

Fire scene in a European city, showing lines of 1½-inch hose branched from 2½-inch hose. From a painting reproduced in "Shepp's Giant Library," a book published in 1897.

(Continued on page 862)

CONTINUOUS TRAINING PROGRAM KEEPS PLANT BRIGADE AT TOP

Anderson, Ind., Mill is Twice Winner of Fire Waste Council Contest

AMONG the most active members of the Anderson, Ind., "Small Industries Fire Prevention" group is the thirty-six-man Fire Brigade of Anaconda Wire and Cable Company's Anderson Mill. These men realize full well how much fire prevention and fire-preparedness means to the security of their own jobs and families; hence they are more than willing to devote considerable time and energy to the extensive study and training which qualifies them not only for prevention and fire-fighting but for first aid and rescue work as well.

The brigade members are individually and carefully selected, on the basis of their interest in fire prevention and their willingness to become active members in all training courses. Selection is personally made by C. H. Bowlin, Anaconda's Safety Director, who completed an intensive training course sponsored by the Anderson Chamber of Commerce and Delco Remy Co.

The training program is divided into three sections, namely, rescue, fire-fighting, and first aid. This is in accordance with American Red Cross Disaster plan. All men in the Fire Brigade are required to complete the regular Red Cross courses in standard and advanced first aid. Members must be thoroughly familiar with methods of combatting any kind of fire which might break out at the mill. This is accomplished by the regular courses conducted by Mr. Bowlin and by the simulated fire-fighting sessions held in the plant yard.

In addition, and because the Anderson Mill is a member of the Small Industries Fire Prevention Group, members are able to take advantage of cooperation offered by the Anderson Fire Department. City firemen visit the plant regularly to instruct them in the handling of hose under high pressure, in "run-throughs" with various types of hand extinguishers and other portable equipment, and in other phases of fire-fighting work. Brigade members have a good operating knowledge of the mill's own sprinkler system. Their handling of the mill's three types of fire extinguishers—CO_2, C.T.C. and dry chemical has become almost second nature, and the 1½- and 2½-inch hose lines are as familiar as their own names.

The local fire department and insurance carriers make frequent inspections of the mill, and make the necessary recommendations to the Safety Director. He in turn interprets them to brigade members at the following meeting, or, when necessary, has them mimeographed in the form of a memorandum.. In addition, the men are constantly studying fire prevention literature and material on new developments put out by prevention-equipment manufacturers.

During the winter months, regular training meetings are held once a month at the mill. During the summer, refresher courses suffice to keep the men up to the mark. Fire Brigade members must attend all meetings and refresher courses, to insure that fire-know-how is always at their finger-tips and foremost in their minds. While some classes are "dry-runs", many are real experiences in fire-fighting. Generally, one fire is set off in the back-yard, and students have the opportunity to observe the more experienced fire fighters among them. Only when they fully understand the problems involved are they permitted to take part themselves in such a demonstration.

Not content with training in the ordinary methods of fire-fighting and control, Fire Brigade members continually keep abreast of new techniques in industrial fire prevention. For example, after seeing films on some particular aspect of fire-fighting, the men discuss what they have seen and then go out to try to emulate it in actual practice. They next return to the classroom, diagnose what they have done and the degrees of success they have achieved, and, finally, re-run the same films, so that the lessons learned will stick with them.

Whenever a fire occurs in any department of the Anaconda mill, it is carefully studied in the fullest detail. The departmental supervisor fills out a form telling the kind of fire, types of extinguishers used and number, amount of damage and estimated cost, and remedies for future fires of similar type. The Fire Brigade studies this material, and decides what methods and equipment, if any, might have been used to get the fire under control more quickly. Research is made into the cause of the fire, and precautionary steps are planned for the prevention of fires of a similar nature. Records are kept on every fire,

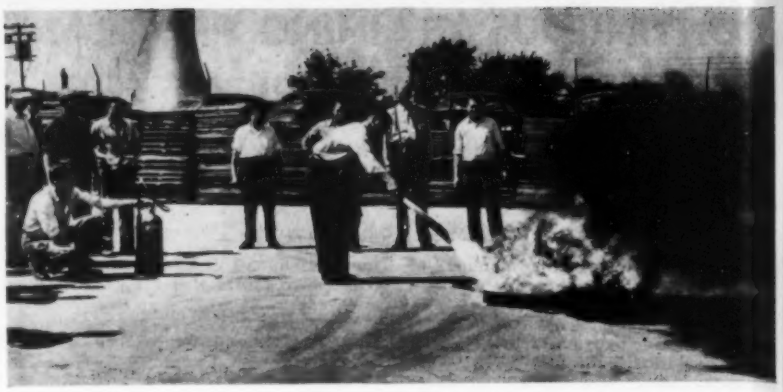
Anderson Fire Department members come out regularly to the Anaconda Wire & Cable Co. mill for a run-through on the correct use of water hose under high pressure. Learning by doing is a major point with every instructor who teaches Fire Brigade members at the Anaconda Mill.

Fire-fighting followup involves First Aid to victims, and every member of the Brigade has had to pass a full course in ministering to various kinds of injury to the different parts of the body. Courses stem directly from Red Cross recommendations on standard and advanced First Aid.

no matter how minor, for the mill knows that even the smallest outbreak can teach an important lesson, and can help to educate plant personnel on causes and prevention. The plant is zoned in that heaviest protection goes into the areas considered most hazardous. These locations are assigned more Brigade members.

The thirty-six members of the mill's Fire Brigade have proved to be cooperative and resourceful students. They are faithful in attendance, are intensely interested in everything that goes on in their classes, and continually offer many useful suggestions on how the mill can improve its fire prevention system.

Each fall, during Anderson city's observance of Fire Prevention Week, the Anaconda brigade has given a demonstration of some kind which dramatizes their own participation in the city's unusual fire record. It is this extraordinary cooperation between mill and city which has been instrumental in achieving the high National Chamber of Commerce rating given Anderson's small industry section, seventh and fourth place in the nation in the past two years.



Success on small equipment is due to frequent handling of the mill's three types of extinguishers, again in actual contact with fires. Here one section of the Brigade attacks a blaze while fellow members stand by to study the technique, and lend a hand where needed.

Detroit Trains Auxiliaries

On May 23rd the Civil Defense fire fighters of Detroit were put to a test when a 24-room building was set afire with ensuing extinguishing action by twelve companies of auxiliary smoke eaters.

Six CD pumpers, using twelve 2½" lines, were used to put out the fire. The exercise was filmed by several news agencies and received nationwide publicity, in addition to being telecast over Station WWJ-TV. The films were later also shown over two other Detroit TV channels.

The proficiency of the CD volunteers was shown by the fact that although the program was to continue for 30 minutes, the Auxiliaries upset the schedule by getting too much of a jump on the blaze. The building was saturated with inflammables, including a considerable amount of drain oil and gasoline. The entire structure was totally involved in five minutes and the CD boys ordered to stretch in and go to work. In exactly five minutes they not only stretched their twelve lines, connected up to hydrants and had the fire under control, thereby throwing the TV broadcast off schedule, but had done such a thorough job that the scheduled water curtain exercise which was to follow had to be performed without the benefit of smoke and flame.

The building was purposely left standing in the center of a rehabilitation area by the Housing Authority and turned over to the fire department for CD practice exercises. At the completion of the exercises, the building was then burned to the ground with regular fire companies standing by.

This demonstration was witnessed by many civic officials and CD authorities and came off without a hitch. The planning and execution of the session was handled by Battalion Chief Harold C. Reinelt, in charge of Civil Defense activities for the Detroit department, and supervised by Edward J. Blohm, Fire Chief.

The ensuing publicity and favorable comment has gone a long way in promoting CD activities in Detroit, in addition to building enthusiasm among the auxiliary fire fighters. The Police Auxiliaries—over 450 in number—participated in controlling crowds and traffic.

Detroit's auxiliary fire fighters operate on fire in 24-room building.

Detroit's CD Auxiliary Fire Fighting Force now numbers 3,050 certified members, and training sessions are held the year-round for new recruits in every fire station. A 70-page printed and illustrated training manual is provided each Auxiliary. This includes sixteen lessons in fire fighting. Refresher courses are held each month for every CD fire company, at which time the men use CD equipment and participate in extended courses of instruction, involving more complex problems.

A continuous recruiting program, using regular fire fighters, goes on winter and summer. In bad weather, fire fighting films are shown and lessons prepared covering subjects that can be treated indoors. Chain-call telephone systems are provided with detailed instruction as to where volunteers may report for duty in case of call back, whether the department is in normal deployment or dispersed in case of attack warning.

The Air Raid Warning System operated by the fire department, which includes twenty (20) Chrysler sirens, has been completely installed. The system is actuated by remote control by the "Bells and Lights" system provided by the Bell Telephone Company.

In addition to regular fire fighting equipment, Detroit's CD fire fighting equipment now includes the following:

23—750 gallon fully equipped fire pumpers
10—Portable fire pumps complete with connections
1—Service ladder truck
20,000—Feet of new 2½" fire hose
3,000—Complete sets of CD—MSA fire helmets
3,000—Sets of rubber boots and coats
Other miscellaneous equipment such as 75 salvage covers, 100 hydrant reducers and wrenches, 30 fog nozzles, spreaders, gates, gasoline cans, etc.

Additional equipment in the process of procurement includes 5,000 feet of 1½" fire hose, two-way broadcasting and receiving sets with portable generators for every fire station, and disaster control and conflagration maps for use in operational procedure following attack, sabotage or normal conflagration.

The State of Michigan has also enacted the necessary CD legislation which provides for the creation and constant maintenance of twenty (20) mobile support groups. Four groups (24

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SUCTION HOSE FRICTION LOSSES DETERMINED BY TESTS AT U. OF W.

Friction Data on Three Sizes Made Available by Henry S. Morton, LCDR, U. S. N., following Comprehensive Tests

DURING the past year, Lieutenant Commander Henry S. Morton carried out a project at the hydraulic laboratories of the University of Washington, on friction loss determinations in hard suction hose of 4½-inch, 5-inch and 6-inch diameters for varying flows.

These data will very effectively supplement those secured in a series of experiments by John R. Freeman, which were conducted in 1889 on the flow of water through fire hose, of which the values of friction factors, at velocities ranging between ten and thirty feet per second, were obtained. The hose included in the Freeman tests was all soft, flexible hose, non-reinforced. To date, very little information has been published on friction factors for hard, wire-reinforced rubber hose.

The principal object of the U. of W investigation was to determine friction losses for various rates of flow in reinforced rubber hose.

The selection of the hose was limited to the material available in the Seattle area, where the laboratory investigations were carried out.

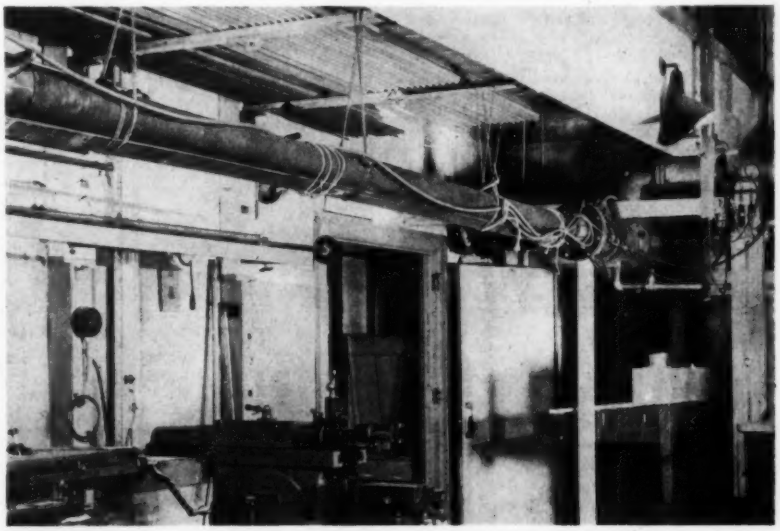
The 4½" hose obtained was new suction hose which was in the custody of the Public Works Department of the Naval Receiving Station, Seattle, Washington. In order to obtain an accurate inside diameter of the hose, the hose was filled with water and the volume of water was weighed. It was necessary to bend the hose in a U shape position in order to get a volume measurement. However, the results of the volume testing indicated that the average inside diameter of the hose was 4.46 inches. By using inside micrometers the inside diameter was measured at 4.50 inches throughout the entire length.

The length of hose used for the test was a 15-foot section wire reinforced fire department suction hose. The actual length of the exposed rubber hose surface was 14 feet, 6½ inches. The inside diameter of the spanner rings and hose couplings was 4-17/32 inches. The hose, in general, meets the military specifications MIL.-H-15100A (Ships), of 15 August 1951. The maximum allowable inside diameter tolerance is plus or minus 1/32 of an inch. The distance between the piezometer pressure take-off connections was 15.56 feet. There was approximately 0.47 foot of length between the piezometer pressure take-off and the commencement of the rubber hose surface. This length was polished brass with slightly varied diameters due to coupling construction and spanner ring rolling methods. All burrs were removed and the joints were carefully aligned to provide a smooth entrance and exit surface. The joints were again examined after the tests for burrs and any obstruction or signs of roughness. The hose was suspended in the horizontal plane and supported by a rigid angle iron bar to prevent sagging. The installation contained no curves or bends.

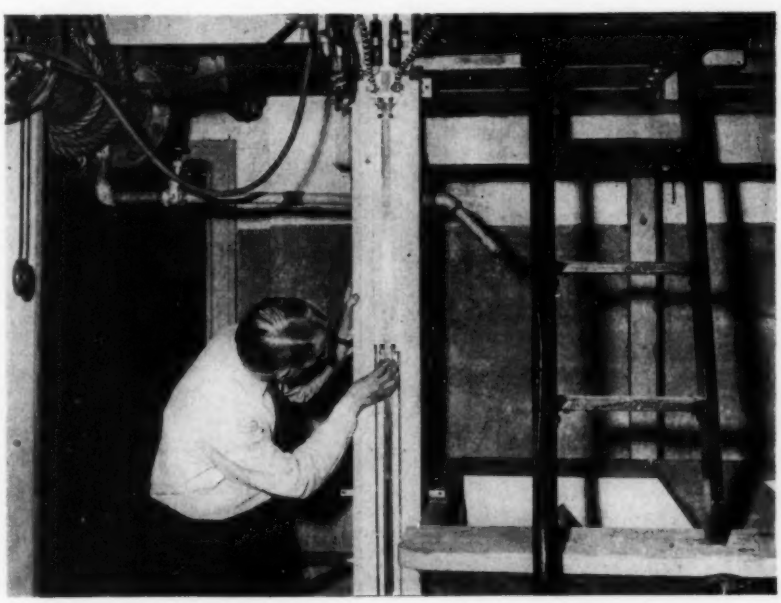
All static pressures were measured in feet of fluid by means of water columns and a mercury U-tube. Both water columns and the U-tube were connected to the piezometer rings by high pressure hoses with facilities and pet-cocks arranged so that the air could be easily bled from the system. The system was purged prior to each test.

The temperatures of the water flowing through the system were measured in degrees Fahrenheit upon entering the receiving tank prior to weighing.

The rate of flow of water through the hose was determined by recording the time required to discharge a given weight of water in the receiving tank. The quantity of water flowing across the piezometer ring was determined by dividing the weight of the water in the receiving tank by the time and density of the water. The average velocity of the water flowing across the piezometer



The above shows the general arrangement of a standard 15-foot length of 4½-inch diameter hard rubber hose connected for testing. The flow of water enters the hose from the steel pipe at the extreme upper left and flows through the hose and discharges into the 1-inch steel pipe shown at the extreme right of the photograph. The hose was supported by a 3½-inch angle bar installed under the hose and supported by manila lines from the overhead. The mercury "U" tube manometer may be seen in the right portion of the photograph.



"U" tube manometer used for measuring pressure drop across 15-foot section of 4½-inch hose.

connection was measured by dividing the quantity flowing by the cross sectional area.

The test conditions and limits of the experiment were entirely dependent upon the facilities available in the hydraulics laboratory. In addition, the type, style, and quality of the hose was restricted to the material available locally. A mercury U-tube monometer was used for measuring the pressure differential as a check against the readings obtained on two independent water columns. The maximum quantities of water which could flow through the test section were dependent upon the ability of the drains within the laboratory to handle the large quantity of water.

Prior to the commencement of any set of tests, the system was operated at maximum capacity, all air drained out of the lines, and all values checked for leakage. In addition, it was desired, where possible, to obtain a constant temperature. Usually all tests were conducted using the maximum rate of flow and slowly "gating" the system for each individual test.

Water column readings were read prior to the commencement of the test, and again at the termination of the test. Since the duration of some tests was as low as thirty-five seconds, it was impracticable to obtain temperature and pressure readings during the actual test. Water temperature readings were obtained at the commencement and completion of each test, and recorded to ½ degree F. In some tests, where large quantities of water are involved and extreme accuracy was required, water was routed into the receiving tank and weighed by routing the water from the receiving tank in partial quantities to the weighing tank. The weighing tank had insufficient capacity to handle the entire quantity of water in the receiving tank. However, the weighing tank was calibrated so that on several tests it was not necessary to weigh each quantity of water. Where low flow rates were used, the water was routed direct to the weighing tank for measuring. Timing of water rates was accomplished by use of a tenth-second interval stopwatch.

Tests were conducted on 4½-inch, 5-inch and 6-inch hard suction hose. The tables herewith give the friction losses for all three sizes at varying flows.

TABLE I

VALUES OF HEAD LOSS PER LINEAR FOOT OF 4½ INCH DIAMETER HARD RUBBER REINFORCED HOSE CORRESPONDING TO QUANTITY OF WATER FLOWING AT 65° F. NEW HOSE*

Quantity Flowing Q1 G.P.M.	Average Velocity V Ft/sec.	Head Loss per Linear Foot of Length hf Feet of Water	Head Loss per Linear Foot of Length hf Inches of Mercury	P.S.I.
2000	40.4	1.055	0.935	0.456
1900	38.4	.957	0.845	0.414
1800	36.4	.863	0.763	0.373
1700	34.4	.774	0.685	0.334
1600	32.3	.690	0.611	0.298
1500	30.3	.610	0.540	0.264
1400	28.3	.535	0.484	0.237
1300	26.3	.465	0.410	0.201
1200	24.2	.399	0.352	0.172
1100	22.2	.338	0.298	0.145
1000	20.2	.282	0.250	0.122
900	18.2	.231	0.205	0.100
800	16.2	.185	0.164	0.0801
700	14.1	.143	0.127	0.0619
600	12.1	.107	0.0947	0.0463
500	10.1	.0756	0.0669	0.0328
400	8.08	.0494	0.0436	0.0214
300	6.06	.0288	0.0255	0.0125
200	4.04	.01325	0.0117	0.0057

*For straight section of hose with a specific roughness coefficient of 0.012.
Note: Not corrected for localized losses.

TABLE II

VALUES OF HEAD LOSS PER LINEAR FOOT OF 6" INCH DIAMETER HARD RUBBER REINFORCED HOSE CORRESPONDING TO QUANTITY OF WATER FLOWING AT 65° F. NEW HOSE*

Quantity Flowing Q1 G.P.M.	Average Velocity V Ft/sec.	Head Loss per Linear Foot of Length hf Feet of Water	Head Loss per Linear Foot of Length hf Inches of Mercury	P.S.I.
2000	22.7	.250	0.221	0.1081
1900	21.6	.226	0.200	0.0978
1800	20.4	.204	0.181	0.0884
1700	19.3	.183	0.162	0.0792
1600	18.1	.163	0.144	0.0706
1500	17.0	.145	0.128	0.0627
1400	15.9	.130	0.115	0.0563
1300	14.8	.110	0.0974	0.0476
1200	13.6	.0945	0.0836	0.0409
1100	12.5	.0799	0.0706	0.0345
1000	11.3	.0670	0.0594	0.0290
900	10.2	.0549	0.0485	0.0238
800	9.07	.0438	0.0388	0.01895
700	7.95	.0339	0.0300	0.01470
600	6.81	.0254	0.0225	0.0110
500	5.67	.0180	0.01595	0.0078
400	4.55	.0117	0.01035	0.00506
300	3.41	.00681	0.00603	0.00295
200	2.27	.00314	0.00278	0.00136

*For straight section of hose with a specific roughness coefficient of 0.012.
Note: Not corrected for localized losses.

TABLE III

VALUES OF HEAD LOSS PER LINEAR FOOT OF 5" DIAMETER HARD RUBBER REINFORCED HOSE CORRESPONDING TO QUANTITY OF WATER FLOWING AT 65° F. NEW HOSE*

Quantity Flowing Q1 G.P.M.	Average Velocity V Ft/sec.	Head Loss per Linear Foot of Length hf Feet of Water	Head Loss per Linear Foot of Length hf Inches of Mercury	P.S.I.
2000	32.72	.6220	.5508	.2693
1900	31.08	.5642	.4997	.2443
1800	29.45	.5091	.4509	.2204
1700	27.81	.4566	.4044	.1977
1600	26.18	.4070	.3604	.1762
1500	24.54	.3599	.3187	.1558
1400	22.90	.3150	.2790	.1364
1300	21.27	.2742	.2428	.1187
1200	19.63	.2355	.2086	.1020
1100	18.00	.1996	.1768	.0864
1000	16.36	.1665	.1475	.0721
900	14.72	.1363	.1207	.0590
800	13.09	.1090	.0965	.0472
700	11.45	.08454	.0749	.03661
600	9.82	.06306	.0647	.02730
500	8.18	.04459	.0395	.01931
400	6.54	.02918	.0258	.01263
300	4.91	.01687	.0149	.00730
200	3.27	.00781	.00692	.00338

*For straight section of hose with a specific roughness coefficient of 0.012.
Note: Not corrected for localized losses.

Juveniles Fire Printing Plant

On Tuesday evening, July 14, 1953, about seven o'clock, firemen at Engine Co. No. 7 located at 910 East Cary Street, Richmond, Va., seeking a cool breeze in front of the building, quickly came to attention when the driver of an empty lumber truck shouted as he passed by, "there is a fire up the street."

No alarm had been received, so one of the firemen was sent to investigate. About two minutes later, a box alarm sounded from box 141, 8th and Franklin Streets. This box is located about one and a half blocks west and two blocks north from the engine house and is a first alarm assignment for No. 7. On arrival, the firemen found a flash fire roaring through the first story of a three-story brick building occupied by Mitchell & Hotchkiss, printers and book binders. This building is separated from buildings facing Main Street by a 10 foot alley. Flames were leaping from the Mitchell & Hotchkiss building and it appeared that these Main Street buildings would soon be involved.

Acting Battalion Chief Samuels quickly pulled second and third alarms, followed by several additional calls. The window frames of one of the Main Street buildings were burned and window glass was cracked by the intense heat. The Mitchell & Hotchkiss building has a 10 foot alley on the south, a parking lot on the west, an alley on the north and faces Eighth Street on the east. Therefore, the firemen were

(*Continued on page 864*)

THIRTY TRAINED FIRE BRIGADES PROTECT LARGEST DISTILLERY

Each Brigade Drilled in Handling Special Hazards Found in Its Particular Section of Plant

THE staggering fire losses experienced by the spirits distilling industry years ago have been overcome largely through the application of scientific fire protective methods and efficient extinguishing equipment. At the world's largest distillery in Peoria, Illinois, Hiram Walker established a program to give maximum protection against the ravage of fire. The plan includes fire extinguishing equipment for production machinery and operation of valves and other vital controls in their departments. Training stresses steps to be taken immediately should fire flash. This is particularly important as more can be done to prevent a serious blaze in the first five minutes than in the following hours.

More than 1400 fire extinguishers, mostly carbon dioxide and water units, are available throughout the Walker plant for first aid fire fighting. Particular care was taken to place them advantageously so that soda acid or water units are located near common combustible materials; carbon dioxide, dry chemical or foam extinguishers are adjacent to flammable liquid hazards; and carbon dioxide, dry chemical or vaporizing liquid portables are available for electrical equipment fires. In addition to the recharge record cards, all of the units bear "how to use" and "on what type of fire" labels.

A constant check is kept on the "safety status" of the plant. One man is employed by the Protection and Safety Department who devotes his full time to checking fire fighting equipment and safety conditions.

A visual education program for all employees is the primary method for general fire safety training. The plan is being rapidly expanded. A recent plant tour by more than 1,500 employees had an elaborate display of all fire-fighting equipment in the distillery as one of its highlights. Further, frequent articles in "Spirit", the company's house organ, point out distillery hazards and the steps being taken by Walker to protect jobs and property against loss by fire.

It is interesting to note that the Liquid Carbonic Company operates its own plant within the Hiram Walker property. As one third of each bushel of grain becomes carbon dioxide during the process of fermentation, it is a large by-product of the distillery. Hiram Walker, therefore, becomes one of the largest suppliers of carbon dioxide for the Kidde extinguishers which it has throughout the plant.

More than 1,500 Walker employees saw this fire safety equipment during a recent plant tour. The technician explains the operation of a carbon dioxide portable extinguisher.

inventory which is complemented by efficient fire brigades and a general safety educational program for all employees.

Hiram Walker counts on its water sprinkler system for basic building fire protection. The system covers 99% of the distillery's buildings which are spread over thirty-six acres. In the plant, only the still tower, power house, fermentors, and evaporators, on which water should not be used to extinguish fire, lack sprinklers. Office areas are also sprinklered with the exception of several expensively furnished rooms.

Thirty trained fire brigades, consisting of a total of a hundred and fifty men, are assigned to all areas and departments of the plant. Members of each brigade are recruited from persons working in the plant area assigned to that unit. This means that fire fighters, particularly familiar with that area of the plant, are immediately available in a local emergency.

Each brigade is trained in the use of portable equipment and receives instruction on potentially hazardous situations in the plant area in which it operates. Brigade members get detailed instruction as to the location and emergency

New First Aid Manikin

A life-size manikin, made of plastics and fiberglass which "bleeds," has been developed by the Navy. The dummy is equipped with mechanical arrangements for pumping simulated blood to make-believe wounds of the leg, arm, abdomen, chest and mouth, or for demonstrating choking due to a foreign substance in the throat.

The world's largest distillery at Peoria, covers thirty-six acres and employs about three thousand people. It is protected by thirty fire brigades.

Hawaiian Firemen Visit Los Angeles

The Los Angeles Fire Department recently was host for a month to 18 Hawaiian firemen who took a 30 day course in arson investigation, fire prevention and industrial fire fighting strategy.

The visitors included Asst. Chief Christian P. Ellis of the Honolulu Fire Department, eight captains, three lieutenants, two engineers, one inspector and three firemen. They were divided into three groups and were deployed to Engines 3, 4 and 22 where they stayed.

While in Los Angeles the group also responded to alarms with city firemen and accompanied them during routine fire inspection tours. The City of Honolulu paid their air fare to the United States and the group arrived at Los Angeles' Airport via United Air Lines.

Los Angeles Assistant Fire Chief Frank E. Winkler and Battalion Chief Mark King greeted the group upon their arrival. Chief King served as department coordinator during their stay and arranged entertainment and their training program. The Hawaiians were feted by numerous civic and private groups and in turn put on a show at Fire Headquarters.

The idea to bring Hawaiian firemen to Los Angeles to study was not new. Two Hawaiians came to Los Angeles in 1932 for study and took back ideas and procedures of the Los Angeles Fire Department. Much of the operations of the Honolulu Fire Department are based upon Los Angeles' systems. Another group of Hawaiians were guests of the Los Angeles Fire Department in 1950.

PAUL C. DITZEL

Los Angeles Fire Department Photos

Above: Frank E. Winkler, Los Angeles Assistant Fire Chief, and Battalion Chief Mark King greet eighteen Hawaiian firemen at Los Angeles Airport.

Below: The Honolulu visitors display a variety of Hawaiian sport shirts at a banquet given in their honor.

A Tel-Aviv Rescue Operation

On May 28, 1953, the Tel-Aviv, Israel, Fire Brigade received a call to rescue a child from a narrow well in the small town of Bne-Barak, on the outskirts of the city.

The Brigade responded at once and found a situation that bid fair to duplicate the Kathy Fiscus episode which made the nation's headlines some years ago.

The Bne-Barak and Ramath-Gan Fire Brigades which answered the call, found that a two-year-old girl had fallen into a well 15 feet deep by one foot diameter. The well had been bored for a new building under construction and had been left uncovered. The youngster fell into the opening while playing nearby, and neighbors, unable to extricate the little victim, called the Brigade.

A resuscitator of the Tel-Aviv Brigade was at once lowered into the opening to supply oxygen and attempts made to get a rope around the tot. All these efforts failed. Nor could a person be found who could be lowered to the trapped child because of the small diameter of the well.

A 7-year-old boy finally volunteered to go down, and, after the Brigade received the approval of the lad's parents, he was tied to a rope and lowered hands and head downward to the little victim. Unfortunately however, he was unable to lift the child, nor could he maintain a hold on her while firemen attempted to pull both out.

After several other attempts, which failed, a 13-year-old girl volunteered to make the effort. She was fastened to a rope and lowered hands and head first down into the well. She was more successful, and after two minutes the trapped child was brought up to the cheers of the large crowd that had gathered.

Next day, Mrs. Rachel Ben-Zwi, the wife of Israel's President, paid a visit to the brave girl rescuer.

Rescue operations were directed by Chief Elkes of Ramath-Gan, Jacobi of Bne-Barak, and Fire Officer M. R. Hartmann of the Tel-Aviv Fire Brigade.

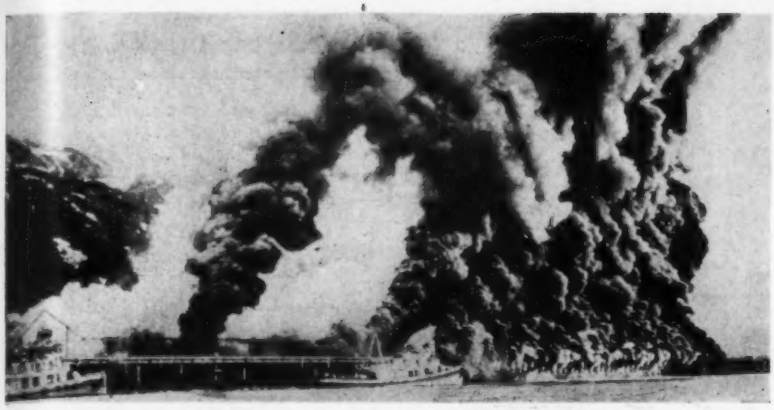
Siren Not Wanted as Neighbor

A petition containing 91 signers who live in 63 homes was presented on Aug. 11, last, to the Board of Directors of the Havertown Fire Co. at Oakmont, a Philadelphia suburb, protesting against the plan to place a fire siren atop the 41-foot water tank of the Philadelphia Suburban Water Co.

Residents who complain they've already been offended by the construction of the tank, "do not want the nuisance of the fire siren." Ernest Heinberg, Fire Chief, told complainants the fire company had been trying for years to find a suitable location for the fire siren and had induced the water company to install it and supply the current for its use. The siren, he said, will be used for civil defense as well as fires.

Another director warned the residents that the firemen "were endeavoring to have low fire insurance rates in the township and if we are unable to get our volunteers to man the engines it will increase our rates. We are protecting 3,700 homes" he said.

In the meantime, the siren reposes in the fire house.



Forty-five servicemen escaped injury from flames at this dock fire in Whittier, Cal., by leaping to the deck of an Army tug. Estimates of loss range up to twenty million dollars.

Costly Alaskan Port Fire

Fire virtually destroyed the military port of Whittier, Alaska, on June 17 last, causing damage to military installations and supplies estimated at $20 million.

The wind-driven flames burned three warehouses, vast amounts of valuable supplies, and the main dock, and injured seven military personnel. Major losses were the 1,200 foot wharf and the three warehouses, which went up in smoke in less than four hours despite the efforts of hundreds of stevedore troops, fire fighters and security personnel, who battled the blaze. The stevedores, however, managed to save much heavy equipment on the main dock. All floating equipment also was saved.

The public information officers said that first reports that an ammunition storage dump had exploded were erroneous. Some small arms ammunition was touched off by the fire, but there is no ammunition dump in the area, he said. The cause of the fire was not disclosed.

Whittier was developed as a military port after World War II. It was 72 miles southwest of Anchorage. It was reported later that military shipments will be increased through the Alaska ports of Valdez, Seward and Anchorage as a result of the fire.

Quebec Forest Fires Rage

On August 18, Quebec's forest fires raged out of control for the eleventh day, having ravaged over 100 square miles of timberland worth over $1 million. A Canadian official said "It will take an act of God to stop this fire."

Over 167 women and children had already been evacuated from its path as the fire threatened the little town of Ste. Therese de Colombier on the north shore of the St. Lawrence River, almost opposite Rimouski, which itself was almost razed by a conflagration a few years ago. Some 700 persons were removed from St. Therese de Colombier, the older boys and men remaining to fight the flames, the worst in Quebec Province in 20 years. Threat of fire also was expected to necessitate the abandonment of Baie St. Paul and other small lumbering and farming communities about 200 miles east of Quebec.

Prayers apparently failing to bring rain, a "rainmaker" was brought from Cambridge, Mass., but he could not find sufficient clouds to bring about precipitation. Meanwhile all telephone communications were limited to emergency calls, and traffic restricted to vehicles carrying refugees from the danger area and to fire-fighting equipment.

Smoke could be seen 300 miles along the St. Lawrence and fresh winds intensified the flames about the time 1,000 fire fighters believed they had them under control. Heavy property losses were suffered by the Anglo-Canadian Pulp and Paper Co., Consolidated Paper Co. and the Quebec Northshore Lumber Co.

The fire broke out on the 10th, and is believed started by berry pickers. In the Quebec area the weather had been dry for three weeks. All lumber operations were suspended. Sixty smaller fires have been reported in the same vicinity. All available fire forces were concentrated in the area.

Fire Damages Creosoting Plant Pier

Fire on July 23 caused $100,000 of damage to the Canada Creosoting plant at North Vancouver, B. C. The four-alarm blaze was brought under control after it had swept 500 feet of the company pier and razed a framing and boring mill.

Vancouver's fireboat was called and darkened the main body of the fire. Then for hours afterwards, firemen struggled with spot fires in the debris under the dock.

Seaweed clogging the suction strainer of pumpers taking suction from the bay, hampered them. Periodically a fireman had to descend into the water to clean out the strainers.

At one stage the fireboat had to be shifted from the west to the east side of the creosote pier, because of low tide.

A towing company tug towed a pump barge from a neighboring drydock, to help extinguish the fire under the pier.

Alert employees shut off valves leading to a tank containing approximately 100,000 gallons of creosote, and thus prevented its involvement by fire.

North Vancouver Fire Chief Bill Thomson praised the work of the Vancouver fireboat.

"The boat and its crew did a wonderful job and certainly deserves credit for breaking the back of this fire," said the chief.

Wind carried embers from the main fire to a second pier several hundred feet away, and the latter became involved, as shown in the illustration herewith.

Fireman Dies in Forest Fire

Corey Goodwin, 50, perished July 31, last, while fighting a runaway forest fire near Sanford, Maine. He was trapped when flames engulfed him after his pumper stalled on a logging road. Witnesses said the victim delayed too long trying to start the truck and was cut off by the fire.

Some 150 firemen, volunteers and Forestry Department and Civil Air Patrol personnel struggled to control the blaze which, fanned by high winds, rapidly cut a path 1½ miles long and about a mile wide.

According to Deputy Forest Commissioner Austin Wilkins of Augusta, Me., this was the first time within his knowledge that a man had been killed while actually fighting a forest fire in his state. He said deaths in the disastrous 1947 fires occurred among persons fleeing the scene.

Striking Picture of an Exposure Fire

While the pier at left, loaded with creosoted timber, was burning, embers were carried by the wind several hundred feet and ignited the pier at right. These fires occurred at North Vancouver, B. C.

Livonia Gets New Fire Station

Breaking of ground for a new $69,000 fire station began Saturday, Aug. 1, on the east side of Farmington road about 600 feet south of Plymouth road, in Livonia, Mich.

Fire Chief Calvin Roberts said the modern new structure should be ready for occupancy by Dec. 1.

It will be designated as Fire Station No. 2 and will replace the present Fire Station No. 1, located on Merriman road near Plymouth.

The new installation will serve the city's most heavily populated area—a total of 12 square miles—bounded by Schoolcraft on the north, Inkster road on the east, Joy road on the south, and Eckles road on the west.

Site of Fire Station No. 2 is in the rear of the major shopping center now under construction on Plymouth at Farmington roads.

The building will be 70 feet long and 67 feet wide. The apparatus room, capable of housing three major vehicles, will be 52 feet long and 33 feet wide. A dormitory, with a 10-bed capacity, will be 25 feet long and 29 feet wide.

The building also will include a lounge, a kitchen, a watch room, a boiler room, and a storage room.

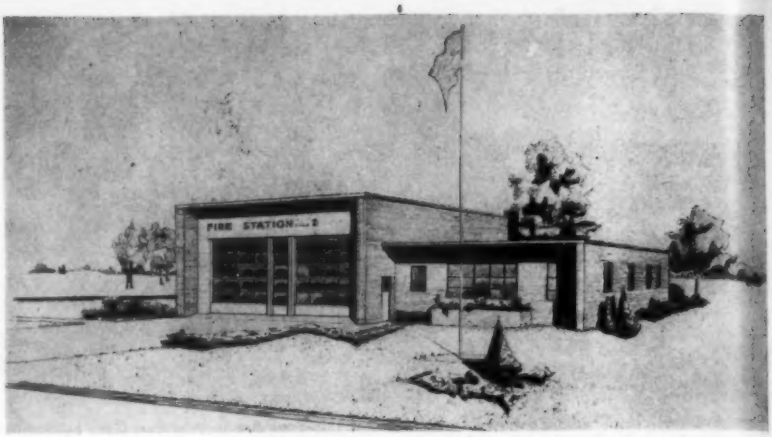
Fire Station No. 2 will be equipped with two 1,000-gallon pumpers. There also will be an emergency panel truck, carrying two resuscitators and other tools for rescue work.

One of the pumpers and the rescue truck are already in operation at the Merriman road station. The second pumper is scheduled for delivery shortly. All three vehicles will be transferred to the new building when it is completed.

Chief Roberts said the new station and its vehicles would be completely radio-controlled.

The Livonia City Council awarded the construction contract to Birchard & Roberts of Dearborn who submitted the low bid of $53,525.

A $11,710 plumbing and heating contract and a $3,975 electrical contract were also awarded.



Architect's drawing of new Livonia fire station.

Protecting Apparatus at Fires

What with the hapless broadcasting of fires and other emergencies, the crowds of curious at such incidents continue to grow apace with added headaches to the fire and law-and-order authorities.

It is not unusual for a fire chief, operating at a serious incident, to find his apparatus completely submerged under the mob of "rubberneckers" who use it as a grandstand—and take no more pains about defacing it than they do the bleachers.

Here is a sample, which comes from Chicago, via Stanley E. Hellberg. In this situation the firemen are busy fighting a fire. The police are busy wrestling with traffic. Fire lines are conspicuous by their absence. Thus it is that youngsters—and some not-so-young—clamber all over one of the Chicago's Fire Department's fine Squad Cars. Nineteen of 'em counting those in sight—and more hidden from view, swarming over and around this vehicle, to scuff, scratch its polished finish, and tamper with its fittings and appliances. Already one inquisitive youngster has started an investigation of the cab.

The firemen are busy fighting a fire. The police are busy battling traffic. Children thus meet no restraining hand as they climb and clamber all over this machine, scuffling and scratching off its finish, and, of course, they must tamper with appliances.

Fire apparatus is hard enough to come by and maintain for duty without having it banged, bruised, mauled and mistreated by a callous and careless thrill-crazy public.

With Police and Fire Departments shorthanded as they are, what can be done about it? Well, *Fire Engineering's* correspondent has one suggestion. In Chicago, a newly formed buff's group known as the 5-11 Club Inc. has expressed an interest in helping eradicate, or at least curtail, this public annoyance and vandalism. Ideas are being worked out for buffs, and perhaps auxiliary firemen not on the fire line, to "police" these rigs. In view of the fact that the Windy City is reported planning to invest about $2 million in new fire apparatus this sort of assistance may come in handy!

How Golden Valley Alerts Volunteers

In June, 1952, FIRE ENGINEERING told about the newest developments in alerting volunteer firemen. That article was read by firemen in the Village of Golden Valley, Minn., just outside the City of Minneapolis, and the volunteers decided to go out and build themselves a system, to their own requirements.

Before this could be accomplished it was of course necessary that the local vamps be willing to give up their spare time, maintain peace at home, and enlist the best brains within the organization and the community if a satisfactory job was to be done.

The lads had to work all day Sunday and Wednesday nights, when weather permitted, from the Spring of 1951 to June, 1952, in order to get their system in working order, but they made it.

The Golden Valley installation is entirely independent of the Bell system because, as A. L. Hanover, secretary of the Golden Valley Fire Department expressed it, " we too had considerable trouble in getting through with the regular telephones."

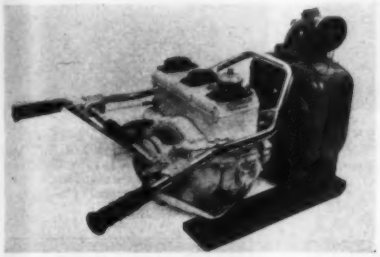
With the help of the Village of Golden Valley, which agreed to purchase all necessary equipment, if the firemen would furnish all labor, the vamps went to work. By September, 1952, they had installed about 22,000 feet of underground cable and approximately 15 miles of overhead lines. At that time they had

(*Continued on page* 869)

News of the Manufacturers

New Fire Pump Attachment by McCulloch

A new fire pump attachment that fits the power unit of all two-man McCulloch chain saws has just been announced by McCulloch Motors Corp., Los Angeles. This pump attachment makes it possible to convert a McCulloch saw into a portable fire pump with capacity up to 250 gallons a minute.



New McCulloch fire pump attachment.

This F P A attachment is the same pump as the McCulloch Model 7-FP, with a special adapter that makes field conversion from saw to portable pump possible in approximately one minute.

The F P A pump attachment is mounted on a wooden base and has a protective screen for the suction hose. It is shipped with adapter already assembled, and is available with 2½ NST (National Standard Inlet Flange), or the regular 3-inch iron pipe thread.

New Fire Extinguishing Agent

A new type of fire extinguishing agent is now in full-scale production at Eston Chemicals Division of American Potash & Chemical Corporation, it was announced recently.

The compound is known chemically as methylene chlorobromide, and is commonly referred to as "CB." It was first developed in Germany during World War II, but only recently began to gain acceptance in this country for use in fire control equipment.

In addition to being more efficient than carbon tetrachloride, CB has a much lower level of human toxicity. It is being used widely in the newer types of U. S. Air Force planes.

Powhatan Brass Expands

Powhatan Brass and Iron Works, Ranson, W. Va., early this year completed a major extension program.

With the completion of a new and larger foundry building, 600x60 feet, the plant area had added 30 per cent more floor space. A fire wall separates the foundry from the furnace and machine rooms.

Much new equipment is being added in some of the departments, and the plant's assembly line has been greatly enlarged. A new testing department and production office have been added.

Where Powhatan used to make only a few items, now practically all types and sizes of the latest in fire fighting equipment is produced.

The original Powhatan plant consisted of a single small building. Today's plant covers over 40,000 feet of floor space, and present payroll totals 125 as compared with the original force of 14.

President and General Manager Charles F. Reininger set up the 15-year expansion program in 1938. On schedule, the program reached completion this year.

John Bean Unit Has Two Pumps

An answer to the controversy of high pressure fog vs. volume has been offered by John Bean Division of Food Machinery and Chemical Corp., at Lansing, Mich., with their new high pressure fog and volume firefighter.

Mounting the original John Bean high-pressure fog pump plus a newly designed centrifugal volume pump on the same chassis offers the crew a total of 6 fire fighting lines. There are two lines of fog and 4 lines of volume. Both pumps can run simultaneously or separately, allowing the crew to select the method of attack best suited to the situation.

Several basic design changes have been made in the new model. To improve road stability, equalize weight distribution, and lower the center of gravity, the high-pressure pump has been moved forward and placed over the volume pump. The same cab-to-axle ratio of 102-105 is being used, but the truck body has been widened to 72".

Because of the widened body and the "stacked" pump design, storage space has been greatly increased. The hose carrying space above the tank has been increased by 60% so it is now possible to carry 1500 ft. of 2½" hose. In addition there are 5 full size compartments to provide storage space for protection of accessory equipment. The rear side compartments are waterproofed to allow carrying of portable pumps, motors and generators.

The piping system has been simplified by providing two sets of three-way valves. Besides eliminating extra valves, this system allows drafting from the tank or outside sources to either the volume or high-pressure pumps. It is even possible to draft from separate sources to each pump or to the pumps operating simultaneously. The draft valve is arranged so that any combination can be selected by moving one lever.

The tank is separate from the structural members of the truck and can be removed for maintenance and repair. It is provided with a rear-fill hopper. A removable strainer allows drafting from debris filled waters. There is an engine-operated priming system. The hose reels mounted on top are covered and can be equipped with a power rewinding apparatus.

New Breathing Apparatus Announced

The Cycle-Flow Company, of Milford, Conn., has recently announced the introduction of a new type of 10-minute breathing apparatus, self-contained, which has been named "Pocketaire." It weighs 4½ pounds complete, and features a 5-minute escape cylinder which may be opened when the working cylinder is exhausted.

New Pocketaire self-contained breathing apparatus.

Designed for use with oxygen, it may be charged from any standard oxygen cylinder, and delivers sufficient volume so that it may be used as an emergency inhalator. The same model, with one 5-minute and one 30-minute cylinder, weighs 8½ pounds complete with mask and shoulder holster.

Pocketaire is new in principle and design, and fits in a coat pocket.

(*Continued on page* 876)

New Bean dual-pump unit in operation.

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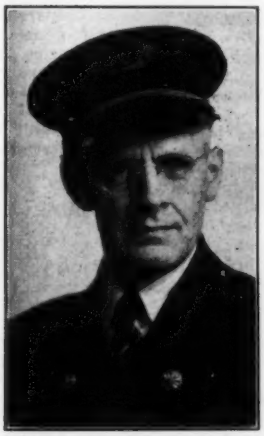

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Inert Gas Protects Against Explosion

Central Soya Company, Inc., of Fort Wayne, Ind., a leading operator in the soybean industry, has put into effect a broad protection program that enabled the company to reduce from 500 to three the number of insurance policies covering its three modern soybean oil extraction plants.

Dollarwise, it has proved a sound investment, representing a saving of approximately $6,000 per month in insurance premiums, according to Central Soya officials.

The protection program is adaptable to most raw material processing in which inert gas may be used as a safety factor.

With emphasis on inert gas generating equipment and sprinkler systems, fire walls and doors, ventilation and other safety measures, the Central Soya program has resulted in safer working conditions at the company's three processing plants for the production of soybean oil and by-products, as well as its Master-Mix livestock and poultry feeds. These soybean processing plants are located at Decatur, Ind., Marion, O., and Gibson City, Ill.

The extraction process involves the use of large amounts of a flammable hydrocarbon solvent (hexane) in the extraction towers. The process separates the flaked bean into liquid soya oil and solid phases. Subsequent steps remove the hexane from the oil and also from the spent flakes in driers, from which the solvent is condensed and recovered.

The protection program is based on recommendations of an insurance company, one of the largest industrial underwriters which specializes in "superior risk" properties.

Coverage under the three insurance policies also provides for periodic variations in inventory, depending on raw materials, materials in process and finished inventory.

Central Soya installed a Roots-Connersville inert gas generator at each of the three plants. Costing approximately $5,000, plus installation, each generator is located in a building separate from the extraction tower itself. Inert oxygen-free gas produced by the generator is blown through the system as needed, both for shutdowns during purging operations and when the tower again is started up for the extraction function. Thus the hexane is introduced into an inert atmosphere well below the combustion range.

Norman F. Kruse, Vice-President and Technical Director of Central Soya Company, commented: "Not only do these generators give us the additional protection required by the underwriters and desired by ourselves for our people, but they reduce to a considerable extent the down-time when towers are purged, every five or six weeks, and thus add considerable productive time for the entire plant."

Henry B. Matthes, insurance company engineer, observed that while this specific case applies only to the soybean processing industry, comparable problems exist in the extraction processing of other beans, nuts and vegetable products, and in the petroleum, mining and other industries. Hazards can be reduced to a great extent, Matthes said, by adequate protective measures, with resultant simplification of insurance handling, reduced premiums and more positive insurance protection.

Jet Plane Crash Burns Home, Kills Nine

Classed as one of the Province of Quebec's most tragic air accidents, seven civilians, five of them children, and two airmen died when an RCAF CF-100 jet fighter on a training flight, dived out of control into Jacques Cartier in suburban Montreal on August 11th.

The screaming plane sliced through power lines and into a row of houses on Westgate avenue. The big jet went right through the houses into a field beyond. Instantly the ruins burst into flames, from which only two persons escaped.

Within minutes of the crash, dirt roads leading to the scene were jammed with cars of the curious. Three towns in the area sent fire fighting equipment to the scene, and Provincial Police joined Jacques Cartier officers in attempting to control the growing crowds. Later, armed airmen from St. Hubert air base arrived and took over. Newspaper photographers and newsmen were "roughed up" according to press accounts, the RCAF guards confiscating some cameras and pictures.

Injured citizens and two policemen hurt in fighting the fire were taken to Notre Dame Hospital, Montreal. Firemen were helpless to save any of the victims, trapped in blazing frame structures. Only after the ruins had cooled were the bodies removed.

Tip On a Diesel Hazard

From Captain Thomas Cassel, Hornell Fire Department, Hornell, N. Y., comes a tip worth passing along. What is said to be the most modern diesel repair shop in existence is located in Hornell and local fire-fighters have learned about fire hazards attendant upon the servicing of these new diesel-operated locomotives.

According to Captain Cassel, as the unit, or units, of the locomotive are placed in the shop, it is very seldom that the engines are shut off except in case of major repairs. Directly over each motor for each unit is a duct and ventilating fan to cary off the exhaust fumes from the engines.

Carbon from the engines collects in the ducts and is ignited from the heat given off by the exhaust. It is reported the department has had two cases of this type of fire within two weeks. The damage involved one new exhaust fan and motor.

Hazard to the fire fighter consists of the possibility of fragments of hot carbon getting into his eyes.

At present not all railroads are using diesels but the trend is toward them and away from steam. Here is another hazard which this new type of locomotive is bringing the fire service.

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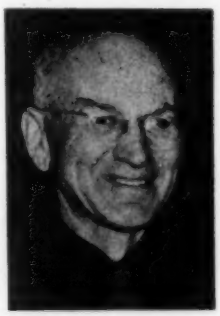

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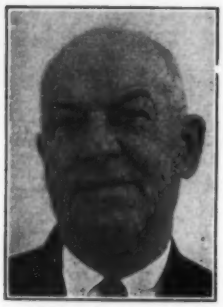

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WHERE TO BUY

Directory of Equipment For Fire Departments

This special feature is provided for the guidance and convenience of fire officials and others concerned with the purchase of fire equipment. The companies listed comprise those whose products have recently been advertised in FIRE ENGINEERING and are thus actively serving the fire protection field.

For information on any type of equipment not listed address Readers' Service Dept., FIRE ENGINEERING, 24 W. 40th St., New York 18, N. Y.

ALARM SYSTEMS

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FIRE-LITE ALARMS, INC.
GAMEWELL COMPANY
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HARRINGTON SIGNAL COMPANY
KIDDE & COMPANY, INC., WALTER

Batteries
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GAMEWELL COMPANY

Boxes
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FEDERAL ENTERPRISES, INC.
GAMEWELL COMPANY
HARRINGTON SIGNAL COMPANY

Central Station
AMERICAN DISTRICT TELEGRAPH CO.
FEDERAL ENTERPRISES, INC.
GAMEWELL COMPANY
HARRINGTON SIGNAL COMPANY
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FEDERAL ENTERPRISES, INC.
FIRE-LITE ALARMS, INC.
FYR-LARM CO., INC.

Industrial
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C-O-TWO FIRE EQUIPMENT COMPANY
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GAMEWELL COMPANY

FOR ADDRESSES
See last page of this section (p. 826)

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EXTINGUISHERS
CO_2
AMERICAN-LA FRANCE-FOAMITE CORP.
C-O-TWO FIRE EQUIPMENT COMPANY
DARLEY & CO., W. S.
ELKHART BRASS MFG. CO., INC.
GENERAL PACIFIC CORP.
GENERAL DETROIT CORP., THE
GENERAL FIRE GUARD CORP., LTD.
KIDDE & COMPANY, INC., WALTER
RANDOLPH LABORATORIES, INC.

Chimney Fire
STANDARD RAILWAY FUSEE CORP., SIGNAL FLARE DIV.

Dry Chemical
AMERICAN-LA FRANCE-FOAMITE CORP.
ANSUL CHEMICAL COMPANY
C-O-TWO FIRE EQUIPMENT COMPANY
DARLEY & CO., W. S.
GENERAL DETROIT CORP.
GENERAL FIRE GUARD CORP., LTD.
GENERAL PACIFIC CORP.
KIDDE & COMPPANY, INC., WALTER
RANDOLPH LABORATORIES, INC.

Foam
AMERICAN-LA FRANCE-FOAMITE CORP.
DARLEY & CO., W. S.
ELKHART BRASS MFG. CO., INC.
GENERAL DETROIT CORP.
GENERAL FIRE GUARD CORP., LTD.
GENERAL PACIFIC CORP.
KIDDE & COMPANY, INC., WALTER
PYRENE MANUFACTURING COMPANY
RANDOLPH LABORATORIES, INC.

Soda & Acid
AMERICAN-LA FRANCE-FOAMITE CORP.
DARLEY & CO., W. S.
ELKHART BRASS MFG. CO., INC.
GENERAL DETROIT CORP.
GENERAL FIRE GUARD CORP., LTD.
GENERAL PACIFIC CORP.
KIDDE & COMPANY, INC., WALTER
PYRENE MANUFACTURING COMPANY
RANDOLPH LABORATORIES, INC.

Vaporizing Liquid
AMERICAN-LA FRANCE-FOAMITE CORP.
DARLEY & CO., W. S.
ELKHART BRASS MFG. CO., INC.
GENERAL DETROIT CORP.
GENERAL FIRE GUARD CORP., LTD.
GENERAL PACIFIC CORP.
KIDDE & COMPANY, INC., WALTER
PYRENE MANUFACTURING COMPANY
RANDOLPH LABORATORIES, INC.

Water
AMERICAN-LA FRANCE-FOAMITE CORP.
DARLEY & CO., W. S.
ELKHART BRASS MFG. CO., INC.
GENERAL DETROIT CORP.
GENERAL PACIFIC CORP.
GENERAL FIREGUARD CORP., LTD.
KIDDE & COMPANY, INC., WALTER
MCFARLAND MANUFACTURING CORP.
PYRENE MANUFACTURING COMPANY
RANDOLPH LABORATORIES, INC.
SMITH AND COMPANY, D. B.

FIRE ALARM & WATCHMAN'S REPORTING SERVICE
AMERICAN DISTRICT TELEGRAPH CO.

FIRE DEPARTMENT SUPPLIES, MISC.
AMERICAN-LA FRANCE-FOAMITE CORP.
CAIRNS AND BRO., INC.
DARLEY & CO., W. S.
DAYTON FIRE EQUIPMENT CO.
EASTMAN CO., INC., SAMUEL
ELKHART BRASS MFG. CO., INC.
EXCELSIOR BRASS MFG. CO.
FIRE MASTER CORP.
GOLD CREST SAFETY EQUIPMENT CORP.
HOWE FIRE APPARATUS CO.
OREN ROANOKE CORPORATION
PACIFIC REFLEX SIGNS
PIRSCH & SONS CO., PETER
SMITH AND COMPANY, D. B.
WARD LA FRANCE TRUCK CORPORATION
WOOSTER BRASS DIV., THE FYR-FYTER CO.

FIRE DETECTION SYSTEMS
AMERICAN DISTRICT TELEGRAPH CO.
AMERICAN-LA FRANCE-FOAMITE CORP.
CARDOX CORP.
C-O-TWO FIRE EQUIPMENT COMPANY
DARLEY & CO., W. S.
FIRE-LITE ALARMS, INC.
FYR-LARM CO., INC.
GAMEWELL COMPANY
GRINNELL COMPANY, INC.
KIDDE & COMPANY, INC., WALTER

FIRE ESCAPES (Permanent)
POTTER FIRE ESCAPE CO.

FIRE ESCAPES (Portable)
DARLEY & CO., W. S.
MAXIM MOTOR CO.

FIRE RETARDMENT MATERIALS
Paint, etc.
DARLEY & CO., W. S.
GOLD CREST SAFETY EQUIPMENT CORP.
QRS NEON CORPORATION, CHEMICAL & PROCESS DIV.

FIRST AID EQUIPMENT
AMERICAN-LA FRANCE-FOAMITE CORP.
BULLARD COMPANY, E. D.
DARLEY & CO., W. S.
EMERSON CO., J. H.
GOLD CREST SAFETY EQUIPMENT CORP.
MINE SAFETY APPLIANCES COMPANY
PAC-KIT COMPANY

FOAM—CHEMICAL—LIQUID
AMERICAN-LA FRANCE-FOAMITE CORP.
DARLEY & CO., W. S.
KIDDE & COMPANY, INC., WALTER
NATIONAL FOAM SYSTEM, INC.
PYRENE MANUFACTURING COMPANY
ROCKWOOD SPRINKLER COMPANY

FOAM GENERATORS OR PUMPS
AMERICAN-LA FRANCE-FOAMITE CORP.
DARLEY & CO., W. S.
HALE FIRE PUMP CO.
KIDDE & COMPANY, INC., WALTER
NATIONAL FOAM SYSTEM, INC.
PYRENE MANUFACTURING COMPANY

FORCIBLE ENTRY TOOLS
AMERICAN-LA FRANCE-FOAMITE CORP.
ATLAS SAFETY EQUIPMENT COMPANY, INC.
C. D. PIKE & FIRE HOOK MFG. CORP.
DARLEY & CO., W. S.
ELKHART BRASS MFG. CO., INC.
HALLIGAN, M. A.
MANN EDGE TOOL COMPANY
PIRSCH & SONS CO.
UNIVERSAL FIRE APPARATUS CORP.
WARD LA FRANCE TRUCK CORPPORATION
WOOSTER BRASS DIV., THE FYR-FYTER CO.

GAS INDICATORS & DETECTORS
KOEHLER MANUFACTURING COMPANY
MINE SAFETY APPLIANCES COMPANY

GAUGES

Testing
DARLEY & CO., W. S.
ELKHART BRASS MFG. CO., INC.
WOOSTER BRASS DIV., THE FYR-FYTER CO.

Pressure
DARLEY & CO., W. S.
WOOSTER BRASS DIV., THE FYR-FYTER CO.

Compound
DARLEY & CO., W. S.
WOOSTER BRASS DIV., THE FYR-FYTER CO.

Piezometers
DARLEY & CO., W. S.
WOOSTER BRASS DIV., THE FYR-FYTER CO.

GENERATORS, AUTOMOTIVE
LEECE NEVILLE CO.

GOGGLES
CAIRNS AND BRO., INC.
DARLEY & CO., W. S.
MINE SAFETY APPLIANCES COMPANY

HARDWARE FOR APPARATUS
ATTWOOD BRASS WORKS

HOOK & PIKE POLES
C. D. PIKE & FIRE HOOK MFG. CO.
DUO-SAFETY LADDER CORP.

HOSE

Cotton, R. L.
AMERICAN-LA FRANCE-FOAMITE CORP.
AMERICAN RUBBER MFG. CO.
BI-LATERAL FIRE HOSE CO.
DARLEY & CO., W. S.
EUREKA FIRE HOSE DIV., U. S. RUBBER CO.
FABRIC FIRE HOSE COMPANY
GENERAL DETROIT CORP.
GENERAL FIREGUARD CORP., LTD.
GENERAL PACIFIC CORP.
GOODRICH COMPANY, B. F.
HEWITT-ROBINS INCORPORATED
OREN ROANOKE CORPORATION
PACIFIC MARINE SUPPLY CO.
QUAKER RUBBER CORPORATION
REPUBLIC RUBBER DIVISION, LEE RUBBER & TIRE CORPORATION
UNIVERSAL FIRE HOSE MFG. CO.

Forestry
AMERICAN RUBBER MFG. CO.
DARLEY & CO., W. S.
EUREKA FIRE HOSE DIV., U. S. RUBBER CO.
FABRIC FIRE HOSE COMPANY
GENERAL DETROIT CORP.
GENERAL FIREGUARD CORP., LTD.
GENERAL PACIFIC CORP.
GOODRICH COMPANY, B. F.
HEWITT-ROBINS INCORPORATED
PACIFIC MARINE SUPPLY CO.
QUAKER RUBBER CORPORATION
REPUBLIC RUBBER DIVISION, LEE RUBBER & TIRE CORPORATION
UNIVERSAL FIRE HOSE MFG. CO.

High Pressure
AMERICAN-LA FRANCE-FOAMITE CORP.
AMERICAN RUBBER MFG. CO.
BI-LATERAL FIRE HOSE CO.
DARLEY & CO., W. S.
EUREKA FIRE HOSE DIV., U. S. RUBBER CO.
FABRIC FIRE HOSE COMPANY
GENERAL DETROIT CORP.
GENERAL FIREGUARD CORP., THE, LTD.
GENERAL PACIFIC CORP.
GOODRICH COMPANY, B. F.
HEWITT-ROBINS INCORPORATED
PACIFIC MARINE SUPPLY CO.
QUAKER RUBBER CORPORATION
REPUBLIC RUBBER DIVISION, LEE RUBBER & TIRE CORPORATION
UNIVERSAL FIRE HOSE MFG. CO.

Chemical
AMERICAN-LA FRANCE-FOAMITE CORP.
AMERICAN RUBBER MFG. CO.
BI-LATERAL FIRE HOSE CO.
DARLEY & CO., W. S.
EUREKA FIRE HOSE DIV., U. S. RUBBER CO.
FABRIC FIREHOSE COMPANY
GENERAL DETROIT CORP.
GENERAL FIREGUARD CORP., LTD.
GENERAL PACIFIC CORP.
GOODRICH COMPANY, B. F.
HEWITT-ROBINS INCORPPORATED
PACIFIC MARINE SUPPLY CO.
QUAKER RUBBER CORPORATION
REPUBLIC RUBBER DIVISION, LEE RUBBER & TIRE CORPORATION

Suction
AMERICAN-LA FRANCE-FOAMITE CORP.
AMERICAN RUBBER MFG. CO.
BI-LATERAL FIRE HOSE CO.
DARLEY & CO., W. S.
EUREKA FIRE HOSE DIV., U. S. RUBBER CO.
FABRIC FIRE HOSE COMPANY
GENERAL DETROIT CORP.
GENERAL FIREGUARD CORP., LTD.
GENERAL PACIFIC CORP.
GOODRICH COMPANY, B. F.
HEWITT-ROBINS INCORPORATED
PACIFIC MARINE SUPPLY CO.
QUAKER RUBBER CORPORATION
REPUBLIC RUBBER DIVISION, LEE RUBBER & TIRE CORPORATION

FOR ADDRESSES
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HOSE APPLIANCES

Holders
AKRON BRASS MFG. CO., INC.
AMERICAN-LA FRANCE-FOAMITE CORP.
DARLEY & CO., W. S.
EASTMAN CO., INC., SAMUEL
ELKHART BRASS MFG. CO., INC.
HOWE FIRE APPARATUS CO.
POWHATAN BRASS & IRON WORKS
WOOSTER BRASS DIV.,THE FYR-FYTER CO.

Expansion Rings, Brass
AKRON BRASS MFG. CO., INC.
BELL-PIHL COMPANY
BUCKEYE IRON & BRASS WORKS
ELKHART BRASS MFG. CO., INC.
EUREKA FIREHOSE DIV., U. S. RUBBER CO.
POWHATAN BRASS & IRON WORKS
WOOSTER BRASS DIV., FYR-FYTER CO.

Increasers
AKRON BRASS MFG. CO., INC.
AMERICAN-LA FRANCE-FOAMITE CORP.
DARLEY & CO., W. S.
EASTMAN CO., INC., SAMUEL
ELKHART BRASS MFG. CO., INC.
HOWE FIRE APPARATUS CO.
McINTIRE BRASS WORKS, F. N.
PACIFIC MARINE SUPPLY CO.
POWHATAN BRASS & IRON WORKS
WOOSTER BRASS DIV., THE FYR-FYTER CO.

Reducers
AKRON BRASS MFG. CO., INC.
AMERICAN-LA FRANCE-FOAMITE CORP.
DARLEY & CO., W. S.
EASTMAN CO., INC., SAMUEL
ELKHART BRASS MFG. CO., INC.
GENERAL DETROIT CORP.
GENERAL FIREGUARD CORP., LTD.
GENERAL PACIFIC CORP.
HOWE FIRE APPARATUS CO.
McINTIRE BRASS WORKS, F. N.
PACIFIC MARINE SUPPLY CO.
POWHATAN BRASS & IRON WORKS
WOOSTER BRASS DIV., THE FYR-FYTER CO.

Hydrant Gates
AKRON BRASS MFG. CO., INC.
AMERICAN-LA FRANCE-FOAMITE CORP.
DARLEY & CO., W. S.
EASTMAN CO., INC., SAMUEL
ELKHART BRASS MFG. CO., INC.
MCINTIRE BRASS WORKS, F. N.
POWHATAN BRASS & IRON WORKS
WOOSTER BRASS DIV., THE FYR-FYTER CO.

Siamese and Y-fittings
AKRON BRASS MFG. CO., INC.
AMERICAN-LA FRANCE-FOAMITE CORP.
DARLEY & CO., W. S.
EASTMAN CO., INC., SAMUEL
ELKHART BRASS MFG. CO., INC.
HOWE FIRE APPARATUS CO.
McINTIRE BRASS WORKS, F. N.
PACIFIC MARINE SUPPLY CO.
POWHATAN BRASS & IRON WORKS
WOOSTER BRASS DIV., THE FYR-FYTER CO.

Siphons
AKRON BRASS MFG. CO., INC.
AMERICAN-LA FRANCE-FOAMITE CORP.
PACIFIC MARINE SUPPLY CO.
WOOSTER BRASS DIV., THE FYR-FYTER CO.

HOSE BRIDGES
AMERICAN-LA FRANCE-FOAMITE CORP.
AUBURN MACHINE AND TOOL CO., INC.
DARLEY & CO., W. S.
MAXIM MOTOR CO.
QUAKER RUBBER CORPORATION
WOOSTER BRASS DIV., THE FYR-FYTER CO.

HOSE CABINET UNITS
AMERICAN RUBBER MFG. CO.
DARLEY & CO., W. S.
ELKHART BRASS MFG. CO., INC.
GENERAL DETROIT CORP.
GENERAL FIREGUARD CORP., LTD.
GENERAL PACIFIC CORP.
PACIFIC MARINE SUPPLY CO.
RANDOLPH LABORATORIES, INC.
WOOSTER BRASS DIV., THE FYR-FYTER CO.

HOSE CARTS, REELS, RACKS
AMERICAN-LA FRANCE-FOAMITE CORP.
AMERICAN RUBBER MFG. CO.
BAR-WAY MANUFACTURING CO.
DARLEY & CO., W. S.
ELKHART BRASS MFG. CO., INC.
GENERAL DETROIT CORP.
GENERAL FIREGUARD CORP., LTD.
GENERAL PACIFIC CORP., LTD.
HANNAY & SON, INC., CLIFFORD B.
MAXIM MOTOR CO.
MINNESOTA FIRE EQUIPMENT CO.
OREN ROANOKE CORPORATION
PACIFIC MARINE SUPPLY CO.
RANDOLPH LABORATORIES, INC.
WOOSTER BRASS DIV., THE FYR-FYTER CO.

HOSE CLAMPS
AKRON BRASS MFG. CO., INC.
AMERICAN-LA FRANCE-FOAMITE CORP.
DARLEY & CO., W. S.
ELKHART BRASS MFG. CO., INC.
PACIFIC MARINE SUPPLY CO.
POWHATAN BRASS & IRON WORKS
WOOSTER BRASS DIV., THE FYR-FYTER CO.

HOSE CLEANER
ESSENTIAL CHEMICALS CO.

HOSE COUPLINGS, ADAPTERS, WRENCHES
AKRON BRASS MFG. CO., INC.
AMERICAN-LA FRANCE-FOAMITE CORP.
AMERICAN RUBBER MFG. CO.
BELL-PIHL COMPANY
DARLEY & CO., W. S.
EASTMAN CO., INC., SAMUEL
ELKHART BRASS MFG. CO., INC.
GENERAL DETROIT CORP.
GENERAL FIREGUARD CORP., LTD.
GENERAL PACIFIC CORP.
HEWITT-ROBINS INCORPORATED
HOWE FIRE APPARATUS CO.
PACIFIC MARINE SUPPLY CO.
POWHATAN BRASS & IRON WORKS
RANDOLPH LABORATORIES, INC.
REPUBLIC RUBBER DIVISION, LEE RUBBER & TIRE CORPORATION
WOOSTER BRASS DIV., THE FYR-FYTER CO.

HOSE DRYERS
CIRCUL-AIR CORPORATION
DARLEY & CO., W. S.
NEEP EQUIPMENT CO.

HOSE EXPANDERS
AKRON BRASS MFG. CO., INC.
AMERICAN-LA FRANCE-FOAMITE CORP.
DARLEY & CO., W. S.
DAYTON FIRE EQUIPMENT CO.
ELKHART BRASS MFG. CO., INC.
POWHATAN BRASS & IRON WORKS
WOOSTER BRASS DIV., THE FYR-FYTER CO.
HOSE STORAGE RACKS
W-B MANUFACTURING CO.

HOSE JACKETS
AKRON BRASS MFG. CO., INC.
DARLEY & CO., W. S.
ELKHART BRASS MFG. CO., INC.
WOOSTER BRASS DIV., THE FYR-FYTER CO.

HOSE STORAGE RACKS
W-B MANUFACTURING CO.

HYDRANT WRENCHES
S-T HYDRANT WRENCH CO.

HYDRANTS
DARLEY & CO., W. S.

JACKS
PORTER INCORPORATED, H. K.

LADDERS

Metal
ALUMINUM LADDER CO.
DARLEY & CO., W. S.
DUO-SAFETY LADDER CORP.
MAXIM MOTOR CO.
MEMCO AERIAL LADDER CO.
PIRSCH & SONS CO., PETER
SEAGRAVE CORPORATION

Rope
ATLAS SAFETY EQUIPMENT CO., INC.

Wood
AMERICAN-LA FRANCE-FOAMITE CORP.
DARLEY & CO., W. S.
DUO-SAFETY LADDER CORP.
MAXIM MOTOR CO.
PIRSCH & SONS CO., PETER
SEAGRAVE CORPORATION

LIFE BELTS
AMERICAN-LA FRANCE-FOAMITE CORP.
ATLAS SAFETY EQUIPMENT COMPANY, INC.
BULLARD COMPANY, E. D.
CAIRNS AND BRO., INC.
DARLEY & CO., W. S.
MEMCO AERIAL LADDER CO.
WOOSTER BRASS DIV., THE FYR-FYTER CO.

LIFE GUNS
DARLEY & CO., W. S.

LIGHTS

Hand Lamps
AMERICAN-LA FRANCE-FOAMITE CORP.
ARGUSLITE CO.
CARPENTER MANUFACTURING CO.
DARLEY & CO., W. S.
KOEHLER MANUFACTURING CO.
McDERMOTT CORP., JULIAN A.
MINE SAFETY APPLIANCES COMPANY
NATALE MACHINE & TOOL CO.
PORTABLE LIGHT CO., INC.
U-C LITE MANUFACTURING CO.

Flares
STANDARD RAILWAY FUSEE CORP., SIGNAL FLARE DIV.

Floodlights
AMERICAN-LA FRANCE-FOAMITE CORP.
ARGUSLITE CO.
CARPENTER MANUFACTURING CO.
DARLEY & CO., W. S.
HOMELITE CORPORATION
McDERMOTT CORP., JULIAN A.
NATALE MACHINE & TOOL CO.
PORTABLE LIGHT CO., INC.
U-C LITE MANUFACTURING CO.

Searchlights
AMERICAN-LA FRANCE-FOAMITE CORP.
ARGUSLITE CO.
CARPENTER MANUFACTURING CO.
DARLEY & CO., W. S.
PORTABLE LIGHT CO., INC.
U-C LITE MANUFACTURING CO.

LIGHTING PLANTS

(Portable; stationary)
AMERICAN-LA FRANCE-FOAMITE CORP.
DARLEY & CO., W. S.
FAIRBANKS-MORSE & CO.
HOMELITE CORPORATION
KATOLIGHT CORP.
KOHLER CO.
ONAN & SONS, INC., D. W.
UNITED STATES MOTORS CORP.

LOUD SPEAKERS

PA Systems
AUDIO EQUIPMENT CO., INC.
GENERAL ELECTRIC COMPANY
SOUND-CRAFT SYSTEMS

Electric Megaphones
AUDIO EQUIPMENT CO., INC.
DARLEY & CO., W. S.
SOUND-CRAFT SYSTEMS

MOTOR APPARATUS

Ambulances
INTERNATIONAL HARVESTER COMPANY

Crash Trucks
AMERICAN-LA FRANCE- FOAMITE CORP.
APPROVED FIRE EQUIPMENT CO.
BEAN DIVISION, JOHN; FOOD MACHINERY & CHEMICAL CORP.
CARDOX CORP.
DARLEY & CO., W. S.
FIRE MASTER CORP.
FOUR WHEEL DRIVE AUTO CO.
GENERAL DETROIT CORP.
GENERAL FIREGUARD CORP., LTD.
GENERAL PACIFIC CORP.
GOLD CREST SAFETY EQUIPMENT CORP.
HOWE FIRE APPARATUS CO.
INTERNATIONAL HARVESTER COMPANY
MACK MANUFACTURING CORPORATION
MAXIM MOTOR CO.
MINNESOTA FIRE EQUIPMENT COMPANY
OREN ROANOKE CORPORATION
ROBINSON, A. F.
SEAGRAVE CORPORATION
SHARPSVILLE STEEL FABRICATORS, INC.
THIELE & SONS, INC., W. J.
UNIVERSAL FIRE APPARATUS CORP.
WARD LA FRANCE TRUCK CORPORATION

Ladder Trucks, Aerial
AMERICAN FIRE APPARATUS CO.
AMERICAN-LA FRANCE-FOAMITE CORP.
APPROVED FIRE EQUIPMENT CO.
DARLEY & CO., W. S.
FOUR WHEEL DRIVE AUTO CO.
GENERAL DETROIT CORP.
GENERAL FIREGUARD CORP., LTD.
GENERAL PACIFIC CORP.
INTERNATIONAL HARVESTER COMPANY
MACK MANUFACTURING CORPORATION
MAXIM MOTOR CO.
PIRSCH & SONS CO., PETER
SEAGRAVE CORPORATION
UNIVERSAL TIRE APPARATUS CORP.

Ladder Trucks, Service
AMERICAN FIRE APPARATUS CO.
AMERICAN-LA FRANCE-FOAMITE CORP.
APPROVED FIRE EQUIPMENT CO.
DARLEY & CO. W.S.
FIRE MASTER CORP.
GENERAL DETROIT CORP.
GENERAL FIREGUARD CORP., LTD.
GENERAL PACIFIC CORP.
HOWE FIRE APPARATUS CO.
INTERNATIONAL HARVESTER COMPANY
KADAS COMPANY, C. F.
MACK MANUFACTURING CORPORATION
MAXIM MOTOR CO.
OREN ROANOKE CORPORATION
PIRSCH & SONS CO., PETER
SEAGRAVE CORPORATION
SHARPSVILLE STEEL FABRICATORS, INC.
THIELE & SONS, INC., W. J.
UNIVERSAL FIRE APPARATUS CORP.
WARD LA FRANCE TRUCK CORPORATION

Pumpers
AMERICAN FIRE APPARATUS CO.
APPROVED FIRE EQUIPMENT CO.
AMERICAN-LA FRANCE-FOAMITE CORP.
BEAN DIVISION, JOHN; FOOD MACHINERY & CHEMICAL CORP.
BLITZ BUGGY COMPANY
BOARDMAN CO.
DARLEY & CO., W. S.
FIRE MASTER CORPORATION
FOUR WHEEL DRIVE AUTO CO.
GENERAL DETROIT CORP.
GENERAL FIREGUARD CORP., LTD.
GENERAL PACIFIC CORP.
HOWE FIRE APPARATUS CO.
INTERNATIONAL HARVESTER CO.
KADAS COMPANY, C. F.
MACK MANUFACTURING CORPORATION

FOR ADDRESSES
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MAXIM MOTOR CO.
MINNESOTA FIRE EQUIPMENT COMPANY
OREN ROANOKE CORPORATION
PACIFIC MARINE SUPPLY CO.
PIRSCH & SONS CO., PETER
ROBINSON, A. F.
SEAGRAVE CORPORATION
SHARPSVILLE STEEL FABRICATORS, INC.
THIELE & SONS, INC., W. J.
UNIVERSAL FIRE APPARATUS CORP.
WARD LA FRANCE TRUCK CORPORATION

Pumpers, High Pressure Fog
AMERICAN FIRE APPARATUS CO.
APPROVED FIRE EQUIPMENT CO.
BEAN DIVISION, JOHN, FOOD MACHINERY & CHEMICAL CORP.
BLITZ BUGGY COMPANY
DARLEY & CO., W. S.
FOUR WHEEL DRIVE AUTO CO.
HOWE FIRE APPARATUS CO.
INTERNATIONAL HARVESTER COMPANY
KADAS COMPANY, C. F.
MACK MANUFACTURING CORPORATION
MAXIM MOTOR CO.
MINNESOTA FIRE EQUIPMENT COMPANY
OREN ROANOKE CORPORATION
PACIFIC MARINE SUPPLY CO.
PIRSCH & SONS CO., PETER
SEAGRAVE CORPORATION, THE
SHARPSVILLE STEEL FABRICATORS, INC.
THIELE & SONS, INC., W. J.
UNIVERSAL FIRE APPARATUS CORP.
WARD LAFRANCE TRUCK CORPORATION

Rescue and Squad Trucks
AMERICAN FIRE APPARATUS CO.
APPROVED FIRE EQUIPMENT CO.
AMERICAN-LA FRANCE-FOAMITE CORP.
BEAN DIVISION, JOHN; FOOD MACHINERY & CHEMICAL CORP.
BOARDMAN CO.
DARLEY & CO., W. S.
FOUR WHEEL DRIVE AUTO CO.
GENERAL DETROIT CORP.
GENERAL FIREGUARD CORP., LTD.
GENERAL PACIFIC CORP.
GOLD CREST SAFETY EQUIPMENT CORP.
INTERNATIONAL HARVESTER COMPANY
MACK MANUFACTURING CORPORATION
MAXIM MOTOR CO.
OREN ROANOKE CORPORATION
SEAGRAVE CORPORATION
SHARPSVILLE STEEL FABRICATORS, INC.
THIELE & SONS, INC., W. J.
UNIVERSAL FIRE APPARATUS CORP.
WARD LAFRANCE TRUCK CORPORATION

Tank Trucks
AMERICAN FIRE APPARATUS CO.
APPROVED FIRE EQUIPMENT CO.
BOARDMAN CO.
DARLEY & CO., W. S.
FOUR WHEEL DRIVE AUTO CO.
GOLD CREST SAFETY EQUIPMENT CORP.
HOWE FIRE APPARATUS CO.
INTERNATIONAL HARVESTER COMPANY
KADAS COMPANY, C. F.
MACK MANUFACTURING CORPORATION
MAXIM MOTOR CO.
MINNESOTA FIRE EQUIPMENT COMPANY
OREN ROANOKE CORPORATION
PIRSCH & SONS CO., PETER
SEAGRAVE CORPORATION
SHARPSVILLE STEEL FABRICATORS, INC.
THIELE & SONS, INC., W. J.
UNIVERSAL FIRE APPARATUS CORP.
WARD LAFRANCE TRUCK CORPORATION

Utility and Repair Trucks
AMERICAN-LA FRANCE-FOAMITE CORP.
FOUR WHEEL DRIVE AUTO CO.
INTERNATIONAL HARVESTER COMPANY
MAXIM MOTOR CO.
OREN ROANOKE CORPORATION
SHARPSVILLE STEEL FABRICATORS, INC.
THIELE & SONS, INC., W. J.
WARD LAFRANCE TRUCK CORPORATION

NETS, LIFE AND TRAINING
AMERICAN-LAFRANCE-FOAMITE CORP.
ATLAS SAFETY EQUIPMENT COMPANY, INC.
DARLEY & CO., W. S.

NOZZLES

Cellar Pipe
AKRON BRASS MFG. CO., INC.
AMERICAN-LAFRANCE-FOAMITE CORP.
AMERICAN RUBBER MFG. CO.
DARLEY & CO., W. S.
ELKHART BRASS MFG. CO., INC.
McINTIRE BRASS WORKS, F. N.
POWHATAN BRASS & IRON WORKS
ROCKWOOD SPRINKLER COMPANY
WOOSTER BRASS DIV., THE FYR-FYTER CO.

Deck Guns
AKRON BRASS MFG. CO., INC.
AMERICAN-LAFRANCE-FOAMITE CORP.
DARLEY & CO., W. S.
EASTMAN CO., INC., SAMUEL
ELKHART BRASS MFG. CO., INC.
McINTIRE BRASS WORKS, F. N.
WOOSTER BRASS DIV., THE FYR-FYTER CO.

Deluge Sets
AKRON BRASS MFG. CO., INC.
AMERICAN-LAFRANCE-FOAMITE CORP.
DARLEY & CO., W. S.
EASTMAN CO., INC., SAMUEL
ELKHART BRASS MFG. CO., INC.
McINTIRE BRASS WORKS, F. N.
WOOSTER BRASS DIV., THE FYR-FYTER CO.

Distributor
AKRON BRASS MFG. CO., INC.
DARLEY & CO., W. S.
ELKHART BRASS MFG. CO., INC.
GOLD CREST SAFETY EQUIPMENT CORP.
WOOSTER BRASS DIV., THE FYR-FYTER CO.

Foam
AMERICAN-LAFRANCE-FOAMITE CORP.
AMERICAN RUBBER MFG. CO.
CARDOX CORP.
DARLEY & CO., W. S.
ELKHART BRASS MFG. CO., INC.
KIDDE & COMPANY, INC., WALTER
NATIONAL FOAM SYSTEM, INC.
PACIFIC MARINE SUPPLY CO.
POWHATAN BRASS & IRON WORKS
PYRENE MANUFACTURING COMPANY
ROCKWOOD SPRINKLER COMPANY

Fog
AKRON BRASS MFG. CO., INC.
AMERICAN FIRE APPARATUS CO.
AMERICAN-LAFRANCE-FOAMITE CORP.
AMERICAN RUBBER MFG. CO.
BEAN DIVISION, JOHN; FOOD MACHINERY & CHEMICAL CORP.
BETE FOG NOZZLE, INC.
BUCKEYE IRON & BRASS WORKS
CARDOX CORP.
DARLEY & CO., W. S.
ELKHART BRASS MFG. CO., INC.
FOG NOZZLE INTERNATIONAL, DIV. OF AKRON BRASS
GRINNELL COMPANY
MYERS & BRO. CO., F. E.
McINTIRE BRASS WORKS, F. N.
PACIFIC MARINE SUPPLY CO.
POWHATAN BRASS & IRON WORKS
ROCKWOOD SPRINKLER COMPANY
WOOSTER BRASS DIV., THE FYR-FYTER CO.

Fog-Foam
AMERICAN RUBBER MFG. CO., INC.
CARDOX CORP.
DARLEY & CO., W. S.
ELKHART BRASS MFG. CO.
PACIFIC MARINE SUPPLY CO.
ROCKWOOD SPRINKLER COMPANY
WOOSTER BRASS DIV., THE FYR-FYTER CO.

Heavy Stream
AKRON BRASS MFG. CO., INC.
AMERICAN-LAFRANCE-FOAMITE CORP.
AMERICAN RUBBER MFG. CO.
CARDOX CORP.
DARLEY & CO., W. S.
ELKHART BRASS MFG. CO., INC.
GENERAL DETROIT CORP.
GENERAL FIREGUARD CORP., LTD.
GENERAL PACIFIC CORP.
McINTIRE BRASS WORKS, F. N.
PACIFIC MARINE SUPPLY CO.
WOOSTER BRASS DIV., THE FYR-FYTER CO.

Pipes, Ladder
AKRON BRASS MFG. CO., INC.
AMERICAN-LAFRANCE-FOAMITE CO.
AMERICAN RUBBER MFG. CO.
DARLEY & CO., W. S.
EASTMAN CO., INC., SAMUEL
McINTIRE BRASS WORKS, F. N.
WOOSTER BRASS DIV., THE FYR-FYTER CO.

Pipes, Play
AKRON BRASS MFG. CO., INC.
AMERICAN-LAFRANCE-FOAMITE CORP.
AMERICAN RUBBER MFG. CO.
BUCKEYE IRON & BRASS WORKS
DARLEY & CO., W. S.
EASTMAN CO., INC., SAMUEL
ELKHART BRASS MFG. CO., INC.
EXCELSIOR BRASS MFG. CO.
GRINNELL COMPANY, INC.
McINTIRE BRASS WORKS, F. N.
NATIONAL FOAM SYSTEM, INC.
POWHATAN BRASS & IRON WORKS
ROCKWOOD SPRINKLER COMPANY
WOOSTER BRASS DIV., THE FYR-FYTER CO.

Shut-Off
AKRON BRASS MFG. CO., INC.
AMERICAN-LAFRANCE-FOAMITE CORP.
AMERICAN RUBBER MFG. CO.
BETE FOG NOZZLE, INC.
BUCKEYE IRON & BRASS WORKS
DARLEY & CO., W. S.
ELKHART BRASS MFG. CO., INC.
EXCELSIOR BRASS MFG. CO.
McINTIRE BRASS WORKS, F. N.
PACIFIC MARINE SUPPLY CO.
POWHATAN BRASS & IRON WORKS
ROCKWOOD SPRINKLER COMPANY
WOOSTER BRASS DIV., THE FYR-FYTER CO.

OIL SPILL DISPERSANT
ESSENTIAL CHEMICALS CO.

OUTBOARD MOTORS
JOHNSON MOTORS

OXYGEN REVIVING APPARATUS

Aspirators
AMERICAN-LAFRANCE-FOAMITE CORP.
E & J MANUFACTURING COMPANY
EMERSON CO., J. H.
MINE SAFETY APPLIANCES COMPANY
STEPHENSON CORPORATION

Inhalators
AMERICAN-LAFRANCE-FOAMITE CORP.
CYCLE-FLO COMPANY
DARLEY & CO., W. S.
E & J MANUFACTURING COMPANY
EMERSON CO., J. H.
MINE SAFETY APPLIANCES COMPANY
SCOTT AVIATION CORP.
STEPHENSON CORPORATION

Respirators
AMERICAN-LAFRANCE-FOAMITE CORP.
EMERSON CO., J. H.
MINE SAFETY APPLIANCES COMPANY
STEPHENSON CORPORATION

Resuscitators
AMERICAN-LAFRANCE-FOAMITE CORP.
DARLEY & CO., W. S.
E & J MANUFACTURING COMPANY
EMERSON CO., J. H.
GOLD CREST SAFETY EQUIPMENT CORP.
MINE SAFETY APPLIANCES COMPANY
STEPHENSON CORPORATION

PETROLEUM DISPERSANT
ESSENTIAL CHEMICALS CO.

POLYSTER FIBRE FOR FIRE HOSE
E. I. DUPONT DE NEMOURS & CO. (INC.), TEXTILE FIBRES DEPT.

POWER PLANTS, ELECTRIC
Portable
AMERICAN-LAFRANCE-FOAMITE CORP.
DARLEY & CO., W. S.
FAIRBANKS-MORSE & CO.
HOMELITE CORPORATION
KATOLIGHT CORP.
KOHLER CO.
ONAN & SONS, INC., D. W.
PACIFIC MARINE SUPPLY CO.
UNITED STATES MOTORS CORP.

Stationary
AMERICAN-LAFRANCE-FOAMITE CORP.
DARLEY & CO., W. S.
FAIRBANKS-MORSE & CO.
KATOLIGHT CORP.
KOHLER CO.
ONAN & SONS, INC., D. W.
UNITED STATES MOTORS CORP.

POWER UNITS, FIRE BOAT
DETROIT DIESEL ENGINE DIV., GENERAL MOTORS
KERMATH MFG. CO.

PROPORTIONERS
AMERICAN-LAFRANCE-FOAMITE CORP.
AQUADYNE CORPORATION
DARLEY & CO., W. S.
McFARLAND MANUFACTURING CORPORATION
NATIONAL FOAM SYSTEM, INC.
PYRENE MANUFACTURING COMPANY
ROCKWOOD SPRINKLER COMPANY

PUMPS
Fire Apparatus
AMERICAN FIRE EQUIPMENT CO.
AMERICAN-LAFRANCE-FOAMITE CORP.
AMERICAN-MARSH PUMPS, INC.
DARLEY & CO., W. S.
FOUR WHEEL DRIVE AUTO CO.
GENERAL DETROIT CORP.
GENERAL FIREGUARD CORP., LTD.
GENERAL PACIFIC CORP.
HALE FIRE PUMP CO.
HOWE FIRE APPARATUS CO.
McCULLOCH MOTORS CORP.
OBERDORFER FOUNDRIES, INC.
WATEROUS COMPANY

Handpumps
AMERICAN-LAFRANCE-FOAMITE CORP.
DARLEY & CO., W. S.
MYERS & BRO. CO., F. E.
PACIFIC MARINE SUPPLY CO.
SMITH AND COMPANY, D. B.

High Pressure
AMERICAN-MARSH PUMPS, INC.
DARLEY & CO., W. S.
GORMAN-RUPP CO.
HALE FIRE PUMP COMPANY
MARINE PRODUCTS COMPANY
McCULLOCH MOTORS CORP.
MYERS & BRO. CO., F. E.
PACIFIC MARINE SUPPLY CO.
WATEROUS COMPANY

Hydrant Dewatering Pumps
AMERICAN-MARSH PUMPS, INC.
DARLEY & CO., W. S.
MARINE PRODUCTS COMPANY

Portable
AMERICAN-MARSH PUMPS, INC.
DARLEY & CO., W. S.
GORMAN-RUPP CO.
HALE FIRE PUMP CO.
HOMELITE CORPORATION
MARINE PRODUCTS COMPANY
MAXIM MOTOR CO.
McCULLOCH MOTORS CORP.
PACIFIC MARINE SUPPLY CO.
SMITH AND COMPANY, D. B.

Suction Boosters
AMERICAN-MARSH PUMPS, INC.
DARLEY & CO., W. S.
GORMAN-RUPP CO.
McCULLOCH MOTORS CORP.
OBERDORFER FOUNDRIES, INC.

Trailer Mounted
DARLEY & CO., W. S.
HALE FIRE PUMP CO.

FOR ADDRESSES
See last page of this section (p. 826)

MAXIM MOTOR CO.
OREN ROANOKE CORPORATION
PACIFIC MARINE SUPPLY CO.
WATEROUS COMPANY

RADIO—TWO WAY, THREE WAY
BENDIX RADIO DIVISION, BENDIX AVIATION CORPORATION
GENERAL ELECTRIC COMPANY
KAAR ENGINEERING CO.
MOTOROLA COMMUNICATIONS & ELECTRONICS, INC.
RADIO CORPORATION OF AMERICA

RADIO—WALKIE TALKIE
BENDIX RADIO DIVISION, BENDIX AVIATION CORPORATION
GENERAL ELECTRIC COMPANY
KAAR ENGINEERING CO.
MOTOROLA COMMUNICATIONS & ELECTRONICS, INC.
RADIO CORPORATION OF AMERICA

RADIO RECEIVERS
BENDIX RADIO DIVISION, BENDIX AVIATION CORPORATION
GENERAL ELECTRIC COMPANY
RADIO APPARATUS CORP.

RECORDERS
DICTAPHONE CORPORATION
GAMEWELL COMPANY
SOUNDSCRIBER CORP.

RESPIRATORY PROTECTIVE EQUIPMENT
Masks
ACME PROTECTION EQUIPMENT CO.
AMERICAN-LAFRANCE-FOAMITE CORP.
BULLARD COMPANY, E. D.
DARLEY & CO., W. S.
MINE SAFETY APPLIANCES COMPANY
SCOTT AVIATION CORP.

Oxygen Breathing Equipment
AMERICAN-LAFRANCE-FOAMITE CORP.
BULLARD COMPANY, E. D.
CYCLE-FLO COMPANY
GOLD CREST SAFETY EQUIPMENT CORP.
MINE SAFETY APPLIANCES COMPANY
SCOTT AVIATION CORP.

Air Breathing Equipment
ACME PROTECTION EQUIPMENT CO.
AMERICAN-LAFRANCE-FOAMITE CORP.
BULLARD COMPANY, E. D.
CYCLE-FLO COMPANY
GOLD CREST SAFETY EQUIPMENT CORP.
MINE SAFETY APPLIANCES COMPANY
SCOTT AVIATION CORP.

SAFETY EQUIPMENT FOR FLAMMABLE LIQUIDS
PROTECTOSEAL CO.

SALVAGE COVERS
AMERICAN-LAFRANCE-FOAMITE CORP.
DANIELS, INC., C. R.
DARLEY & CO., W. S.
FULTON BAG & COTTON MILLS

SAWS, CHAIN
HOMELITE CORPORATION
McCULLOCH MOTORS CORP.

SIGNS & EMBLEMS, APPARATUS
LANE, E. B., DISTRIBUTOR
WENTWORTH-FORMAN CO., INC.

SLIDING CHUTES, FIRE STATION
POTTER FIRE ESCAPE CO.

SLIDING POLES, Fire Station
McINTIRE BRASS WORKS, F. N.

SMOKE & ODOR REMOVERS (Chemical)
DARLEY & CO., W. S.

SMOKE DETECTORS
AMERICAN DISTRICT TELEGRAPH CO.
CARDOX CORPORATION

SPACE HEATERS, Portable
AMERICAN AIR FILTER CO.

SPRINKLER SUPERVISORY SERVICE
AMERICAN DISTRICT TELEGRAPH CO.

SPRINKLERS & SYSTEMS
AKRON BRASS MFG. CO., INC.
FOG NOZZLE INTERNATIONAL, DIV. OF AKRON BRASS
GRINNELL COMPANY, INC.
ROCKWOOD SPRINKLER COMPANY

STRETCHERS
AMERICAN-LAFRANCE-FOAMITE CORP.
DARLEY & CO., W. S.
GOLD CREST SAFETY EQUIPMENT CORP.
MINE SAFETY APPLIANCES COMPANY

SPLINTS
MINE SAFETY APPLIANCES COMPANY

THREAD CUTTING EQUIPMENT
AKRON BRASS MFG. CO., INC.
DARLEY & CO., W. S.
ELKHART BRASS MFG. CO., INC.

TROPHIES & PLAQUES
INTERNATIONAL BRONZE TABLET CO., INC.

THAWING EQUIPMENT, Hydrant
DARLEY & CO., W. S.

VALVES
Hose
AKRON BRASS MFG. CO., INC.
BUCKEYE IRON & BRASS WORKS
DARLEY & CO., W. S.
ELKHART BRASS MFG. CO., INC.
GENERAL DETROIT CORP.
GENERAL FIREGUARD CORP., LTD.
GENERAL PACIFIC CORP.
GRINNELL COMPANY, INC.
HALE FIRE PUMP CO.
McINTIRE BRASS WORKS, F. N.
PACIFIC MARINE SUPPLY CO.
POWHATAN BRASS & IRON WORKS
WOOSTER BRASS DIV., THE FYR-FYTER CO.

Hydrant—Gate
AKRON BRASS MFG. CO., INC.
BUCKEYE IRON & BRASS WORKS
DARLEY & CO., W. S.
EASTMAN CO., INC., SAMUEL
ELKHART BRASS MFG. CO., INC.
McINTIRE BRASS WORKS, F. N.
POWHATAN BRASS & IRON WORKS
WOOSTER BRASS DIV., THE FYR-FYTER CO.

Relief
DARLEY & CO., W. S.
HALE FIRE PUMP CO.
PACIFIC MARINE SUPPLY CO.
WATEROUS COMPANY
WOOSTER BRASS DIV., THE FYR-FYTER CO.

WATER TANKS, Portable Canvas
HARODIKES, INCORPORATED

WEARING APPAREL
Asbestos Protective Clothing
AMERICAN LAFRANCE-FOAMITE CORP.
DARLEY & CO., W. S.
INDUSTRIAL SAFETY SPECIALTIES CO.
MINE SAFETY APPLIANCES COMPANY

Boots
AMERICAN LAFRANCE-FOAMITE CORP.
BEACON FALLS RUBBER FOOTWEAR
BODY GUARD MFG. CO.
CAIRNS AND BRO., INC.
DARLEY & CO., W. S.
EUREKA FIRE HOSE DIV., U. S. RUBBER CO.
MINE SAFETY APPLIANCES COMPANY
SPERRY TOP-SIDERS
UNITED STATES RUBBER CO.

Clothing, Rubber & Canvas
AMERICAN LAFRANCE-FOAMITE CORP.
BODY GUARD MFG. CO.
CAIRNS AND BRO., INC.
DARLEY & CO., W. S.
EUREKA FIRE HOSE DIV., U. S. RUBBER CO.
GLOBE MANUFACTURING CO.
GOODRICH COMPANY, B. F.
JANESVILLE APPAREL CO.
MIDWESTERN MFG. COMPANY
MORNING PRIDE MFG. CO.

Hats and Caps—Uniform
AMERICAN LAFRANCE-FOAMITE CORP.
BRUNSSEN CO., INC., GEORGE
CAIRNS AND BRO., INC.
DARLEY & CO., W. S.
EUREKA FIRE HOSE DIV., U. S. RUBBER CO.
RUSSELL UNIFORM CO.
WENTWORTH-FORMAN CO., INC.

Helmets
AMERICAN LAFRANCE-FOAMITE CORP.
CAIRNS AND BRO., INC.
DARLEY & CO., W. S.
MINE SAFETY APPLIANCES COMPANY

Shirts, Uniform
CAIRNS AND BRO., INC.
DARLEY & CO., W. S.
RUSSELL UNIFORM CO.

Suits
RUSSELL UNIFORM CO.

Suits, Quick Hitch
CAIRNS AND BRO., INC.
DARLEY & CO., W. S.
GLOBE MANUFACTURING CO.
JANESVILLE APPAREL CO.
MORNING PRIDE MFG. CO.

WETTING AGENTS
AMERICAN LAFRANCE-FOAMITE CORP.
AQUADYNE CORPORATION
DARLEY & CO., W. S.
FIREWATER CO.
GENERAL ANILINE & FILM CORP.
GENERAL DETROIT CORP.
GENERAL FIREGUARD CORP., LTD.
GENERAL PACIFIC CORP.
NATIONAL FOAM SYSTEM, INC.
ROCKWOOD SPRINKLER COMPANY

DIRECTORY OF MANUFACTURERS

Listed in WHERE TO BUY SECTION

Acme Protection Equipment Co., 3037 W. Lake St., Chicago 12, Ill.
Akron Brass Mfg. Co., Wooster, Ohio
Aluminum Ladder Co., Worthington, Pa.
American Air Filter Co., Herman Nelson Div., 217 Central Ave., Louisville 8, Ky.
American District Telegraph Co., 155 Sixth Ave., New York 13, N. Y.
American Fire Apparatus Co., Battle Creek, Mich.
American Fire Equipment Co., 717 Boylston St., Boston 16, Mass.
American-LaFrance-Foamite Corp., Elmira, N. Y.
American-Marsh Pumps, Inc., Battle Creek, Mich.
American Rubber Mfg. Co., 1145 Park Ave., Oakland, Cal.
Ansul Chemical Co., Marinette, Wis.
Approved Fire Equipment Co., 101 Long Beach Rd., Oceanside, L. I., N. Y.
Aquadyne Corp., 441 Lexington Ave., New York 17, N. Y.
Argusiite Co., Blue Ridge Summit, Pa.
Atlas Safety Equipment Co., 27 Warren St., New York 7, N. Y.
Attwood Brass Works, 303 Douglas Ave., Grand Rapids, Mich.
Auburn Machine and Tool Co., 30 Aurelius Ave., Auburn, N. Y.
Audio Equipment Co., Inc., 805 Middleneck Rd., Great Neck, L. I., N. Y.

Bar-Way Mfg. Co., Stamford, Conn.
Beacon Falls Rubber Footwear, Div., U. S. Rubber Co., Beacon Falls, Conn.
Bean Div., John, Food Machinery and Chemical Corp., Box 840, Lansing 4, Mich.
Bell-Pihl Co., 17 Wyman St., Arlington 74, Mass.
Bendix Radio Div., Bendix Aviation Corp., 2120 N. Charles St. Baltimore 10, Md.
Bete Fog Nozzle, Inc., 309 Wells St., Greenfield, Mass.
Biersach & Niedermeyer Co., 1931 N. Hubbard St., Milwaukee 12, Wis.
Bi-Lateral Fire Hose Co., 20 N. Wacker Dr., Chicago 6, Ill.
Blaskintan & Co., Inc., V. H., Attleboro Falls, Mass.
Blitz Buggy Co., Main St., Old Forge, N. Y.
Boardman Co., P. O. Box 1152 Oklahoma City, Okla.
Body-Guard Mfg. Co., 222 S. Fourth St., St. Joseph, Mo.
Braxmar Co., C. G., 210 E. 45th St., New York, N. Y.
Brooklyn Fibre Broom Co., Inc., 47 Dinsmore Pl., Brooklyn 8, N. Y.
Brunsson Company, Inc., George, 104-106 Bleecker St., New York 12, N. Y.
Buckeye Iron & Brass Works, P. O. Box 883, Dayton 1, Ohio
Bullard Company, E. D., 275 Eighth St., San Francisco 3, Cal.

Cairns and Brother, Inc., 854 Bloomfield Ave., Allwood, Clifton, N. J.
Cardex Corp., 307 N. Mich. Ave., Chicago 1, Ill.
Carpenter Mfg. Co., Bradley and Pearl Sts., Boston 45, Mass.
C. D. Pike & Fire Hook Mfg. Corp., 307 Orange St., New Haven 11, Conn.
Chesebrough Mfg. Co., Cons'd, Professional Products Div., 17 State St., New York 4, N. Y.
Circul-Air Corp., 575 E. Milwaukee Ave., Detroit 21, Mich.
C-O-Two Fire Equipment Co., P. O. Box 390, U. S. Highway 1, Newark 1, N. J.
Cycle-Flo Co., Milford, Conn.

Daniels, Inc., C. R., 4900 Wetheredsville Rd., Baltimore 16, Md.
Darley & Co., W. S., 2810 Washington Blvd., Chicago 12, Ill.
Dayton Fire Equipment Co., 1242 W. Second St., Dayton 7, Ohio.
Detroit Diesel Engine Div., General Motors Corp., 13400 W. Outer Dr., Detroit, Mich.
Dictaphone Corp., 420 Lexington Ave., New York 17, N. Y.
Duo-Safety Ladder Corp., 809 Ninth St., Oshkosh, Wis.
Du Pont de Nemours & Co., Inc., E. I., Textile Fibers Dept., Wilmington 98, Del.

E & J Mfg. Co., 100 E. Graham St., Burbank, Cal.
Eastman Co., Inc., Samuel. Carpenter St., Concord, N. H.
Elkhart Brass Mfg. Co., Inc., 1302 W. Beardsley Ave., Elkhart, Ind.
Emerson Co., J. H., 22 Cottage Park Ave., Cambridge 40, Mass.
Essential Chemicals Co., 2200 N. 32nd St., Milwaukee 8, Wis.
Eureka Fire Hose Div., U. S. Rubber Co., 195 Hudson St., New York 13, N. Y.
Everson-Ross Co., Inc., 86 Chambers St., New York 7, N. Y.
Excelsior Brass Co., 3452 N. Knox Ave., Chicago 41, Ill.

Fabric Fire Hose Co., Sandy Hook, Conn.
Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.
Federal Enterprises, Inc., 8700 S. State St., Chicago 19, Ill.
Fire-Lite Alarms, Inc., 190 Fulton Terrace, New Haven 2, Conn.
Fire Master Corp., 36100 Harper St., Mt. Clemens, Mich.
The Firewater Co., One First St., Los Altos, Cal.
Fog Nozzle International, Wooster, Ohio
Four Wheel Drive Auto Co., Clintonville, Wis.
Fulton Bag & Cotton Mills, P. O. Box 1726, Atlanta 1, Ga.
Fyr-Larm Co., Inc., 332 Springfield Ave., Summit, N. J.

Gamewell Co., Newton Upper Falls 64, Mass.
General Aniline & Film Corp., 435 Hudson St., New York, N. Y.
General Detroit Corp., 2272 E. Jefferson Ave., Detroit 7, Mich.
General Electric Co., Bldg. 1, Electronics Park, Syracuse 1, N. Y.
General Fireguard Corp., Ltd., 978 St. Luke Rd., Windsor, Ontario, Canada.
General Pacific Corp., 1501 E. Washington Blvd., Los Angeles 21, Cal.
Globe Manufacturing Co., Pittsfield, N. H.
Gold Crest Safety Equipment Corp., P. O. Box 155, Dunellen, N. J.
Goodrich Company, B. F., 500 S. Main St., Akron, Ohio
Gorman-Rupp Co., 305 Bowman St., Mansfield, Ohio...
Grinnell Co., Inc., 260 W. Exchange St., Providence 1, R. I.

Hale Fire Pump Co., Conshohocken, Pa.
Halligan Tool Co., 1505 Metropolitan Ave., New York 62, N. Y.
Hannay & Son, Inc., Clifford B. Westerlo, N. Y.
Harodikes, Inc., North Dighton, Mass.
Harrington Signal Co., 116 17th St., Moline, Ill.
Hewitt-Robins, Inc., Hewitt Rubber Div., 240 Kensington Ave., Buffalo 5, N. Y.
Homelite Corp., 67 Riverdale Ave., Port Chester, N. Y.
Howe Fire Apparatus Co., 1402 W. 22nd St., Anderson, Ind.

International Bronze Tablet Co., Inc., 150 West 22nd St., New York 11, N. Y.
International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.
Industrial Safety Specialties Co., Eighth and Chestnut Sts., Perkasie, Pa.

Janesville Apparel Co., P. O. Box 306, Janesville, Wis.
Johnson Motors, 6000 Pershing Rd., Waukegan, Ill.

Kaar Engineering Co., 2815 Middlefield Rd., Palo Alto, Cal.
Kadas Company, C. F., P. O. Box 206, Oceana, Va.
Kalolight Corp., Mankato, Minn.
Kermeth Mfg. Co., 5885 Commonwealth Ave., Detroit 8, Mich.
Kidde & Company, Inc., Walter, 458 Main St., Belleville 9, N. J.
Koehler Mfg. Co., 395 Lincoln St., Marlboro, Mass.
Kohler Co., Kohler, Wis.

La Marche Mfg. Co., 18 Lake St., Wakefield 8, R. I.
Lane, E. B., 32 Greenwood Ave., Toledo 5, Ohio
Leece-Neville Co., 5109 Hamilton Ave., Cleveland, Ohio.

McCulloch Motors Corp., 6101 W. Century Blvd., Los Angeles 45, Cal.
McDermott Corp., Julian A., 4022 National St., Corona, N. Y.
McFarland Mfg. Corp., 1630 Roberts St., Houston 3, Tex.
McIntire Brass Works, F. N., 377 Putnam Ave., Cambridge 39, Mass.
Mack Manufacturing Corp., 350 Fifth Ave., New York 1, N. Y.
Mann Edge Tool Co., Lewistown, Pa.
Marine Products Co., 515 Lycaste, Detroit 14, Mich.
Maxim Motor Co., Middleboro, Mass.
Memco Aerial Ladder Co., 1007 N. W. 36th St., Oklahoma City 3, Okla.
Midwestern Mfg. Co., Mackinaw, Ill.
Mine Safety Appliances Co., 201 North Braddock Ave., Pittsburgh 8, Pa.
Minnesota Fire Equipment Co., North Branch, Minn.
Morning Pride Mfg. Co., 1936 Home Ave., Dayton, Ohio
Motorola, Communications & Electronics, Inc., 900 N. Kilbourn Ave., Chicago 51, Ill.
Myers and Bro. Co., F. E., Orange and Fourth, Ashland, Ohio

Natale Machine and Tool Co., 339 State Highway No. 17, Carlstadt, N. J.
National Foam System, Inc., Union and Adams Sts., West Chester, Pa.
Neep Equipment Company, 326 N. W. Broadway, Portland 9, Ore.

Oberdorfer Foundries, Inc., Syracuse 1, N. Y.
Onan and Sons, Inc., D. W., University Ave. & 23th St., S. E., Minneapolis 14, Minn.
Oren Roanoke Corp., 1201-09 West Salem Ave., Roanoke 16, Va.

Pacific Marine Supply Co., 1223 Western Ave., Seattle 1, Wash.
Pacific Reflex Signs, Box 323, McMinnville, Ore.
Pac-Kit Company, P. O. Box 1306, Greenwich, Conn.
Pirsch & Sons Co., Peter, 1308 35th St., Kenosha, Wis.
Portable Light Co., Inc., 216 William St., New York 38, N. Y.
Porter, Inc., H. K., 74 Foley St., Somerville 43, Mass.
Potter Fire Escape Co., 6109 N. California Ave., Chicago, Ill.
Pewhatan Brass & Iron Works, N. Mildred St., Ranson, W. Va.
Protectoseal Co., 1920 So. Western Ave., Chicago 8, Ill.
Pyrene Manufacturing Co., 10 Empire St., Newark 8, N. J.

QRS Neon Corp., Chemical and Process Div., 170 N. Halstead, Pasadena 8, Cal.
Quaker Rubber Corp., Fire Hose Div., Comly and Tacony Sts., Philadelphia 24, Penn.

Radio Apparatus Corp., 55 N. New Jersey, Indianapolis, Ind.
Radio Corp. of America, Engineering Products Dept., Camden 2, N. J.
Randolph Laboratories, Inc., 8 E. Kinzie St., Chicago 11, Ill.
Reese, S. H., 57 Warren St., New York, N. Y.
Republic Rubber Div., Lee Rubber & Tire Corp., Albert St., Youngstown 1, Ohio.
Robinson, A. F., 200 Second St., Cambridge, Mass.
Rockwood Sprinkler Co., 38 Harlow St., Worcester 5, Mass.
Russell Uniform Co., 192 Lexington Ave., New York 16, N. Y.

Scott Aviation Corp., 207 Erie St., Lancaster, N. Y.
Seagrave Corp., 2000 S. High St., Columbus 7, Ohio.
Sharpsville Steel Fabricaters, Inc., Sixth & Main Sts., Sharpsville, Pa.
Sirene Co., Inc., 214 Williams St., New York 38, N. Y.
Smith and Co., D. B., 414 Main St., Utica, N. Y.
Sound-Craft Systems, R3-161 Rochester Rd., Pittsburgh 2, Pa.
SoundScriber Corporation, 146 Munson St., New Haven 4, Conn.
Sperry Top-Siders, Beacon Falls, Conn.
S-T Hydrant Wrench Co., Holyoke, Mass.
Standard Railway Fusee Corp., Signal Flare Div., P. O. Box 30, Needham Heights, Mass.
Stephenson Corp., P. O. Box 392, Red Bank, N. J.
Sterling Siren Fire Alarm Co., Inc., 6 Bartlett St., Rochester 8, N. Y.
Super Vacuum Manufacturing Co., 319 E. 17th Ave., Denver 3, Colo.

Thiele & Sons, Inc., W. J., 170 Pine St., Johnstown, Pa.
Trippe Manufacturing Co., 218 N. Jefferson St., Chicago 6, Ill.

U-C Lite Mfg. Co., 1050 West Hubbard St., Chicago 22, Ill.
U. S. Motors Corp., Oshkosh, Wis.
United States Rubber Co., Rockefeller Center, New York, N. Y.
Universal Fire Apparatus Corp., P. O. Box 184, Logansport, Ind.
Universal Fire Hose Mfg. Co., North Bergen, N. J.

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Wentworth-Forman Co., Inc., 21 Edinboro St., Boston 11, Mass.
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FOR ADVERTISERS
in the issue see Advertising Index on p. 890 facing inside back cover

figured in years of service,

EUREKA
MULTIPLE-WOVEN
FIRE HOSE

costs least... gives most!

Fire departments of cities like Willimantic, Connecticut, that keep accurate records of every length of hose, can show you Eureka *Multiple-Woven* Hose purchased more than 25 years ago *still giving dependable service.*

Suppose Willimantic had "saved" 50% of its initial investment by purchasing minimum priced hose. Assuming an average service life of four years for such hose, the department would have required six purchases during the past 25 years... at a total cost at least three times greater than Eureka Multiple-Woven. But, considering price increases in the "cheaper" hose during the years, such a short-sighted policy might easily have cost *four or five times* the original cost of Eureka *Multiple-Woven.*

Eureka makes and sells all grades of fire hose. But, for real, long-range economy—with a bonus of unexcelled dependability and safety—we recommend Eureka 3- or 4-ply *Multiple-Woven*, the unique, long-wearing hose with the jacket whose plies are simultaneously woven *and interwoven* into a homogeneous covering that leaves no room between plies for water, dirt or mildew. **Only Eureka makes such a hose!** Eureka developed and built the complicated looms that circular-weave the jacket... and they have never been successfully duplicated! Write for folder describing all the unique features of this great hose.

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"For greater protection to life and property"

EUREKA FIRE HOSE

Since 1875, Specialists in Manufacturing Circular-Woven Cotton Rubber-Lined Fire Hose

195 Hudson Street • New York 13, N. Y.

Division of United States Rubber Company

FALSE ALARMS

Know-How

The colonel was lecturing a class of officers. "A 40 foot flagpole has fallen down," he said. "You have a sergeant and a squad of 10 men. How do you erect the flagpole again?"

The candidates thought, then made suggestions about block and tackle, derricks and so on.

"You're all wrong," said the colonel. "You'd say: 'Sergeant, get that flagpole up'."

Specialization

A business executive was well on the way to recovery from an appendectomy and as his nurse was about to leave him for the night, she asked, "Is there anything else I can do for you before turning off the light?"

"Yes," smirked the business executive, "you have not kissed me good night."

"I'll call the janitor," she retorted. "He does the dirty work around here."

First Mechanic: "I haven't touched a drop in over two months."

Second Mechanic: "Neither have I, pal, but don't you think we had better knock on wood?"

First Mechanic: "Positively, boy. Let's go pound on a bar."

The measure of a man's real character is what he would do if he knew he would never be found out.

"A few more false alarms, and he'll never be able to dance in time for the firemen's ball!"

Old Jones, a town character, was determined to mend his ways, so he did not stop at his favorite tavern on the way home. He just stiffened his spine, took a firm clutch on his will power and passed on by without so much as a backward, longing glance. After walking fifty feet or so, he came to an abrupt stop and said to himself: "Jonesy, old pal, I'm right proud of you. Come back to the tavern and I'll treat you to a snort or two."

"If you're coming through here you'll have to take off those boots!"

Asked to write a brief essay on the life of Benjamin Franklin, a little girl wrote this gem of a paragraph:

"He was born in Boston; traveled to Philadelphia; met a lady on the street; she laughed at him; he married her; and discovered electricity."

Barney: "A fine boy you have, Terry. A magnificent head and noble features. Could you lend me five dollars?"

Terry: "He is my wife's son by her first marriage. I could not."

Helpful

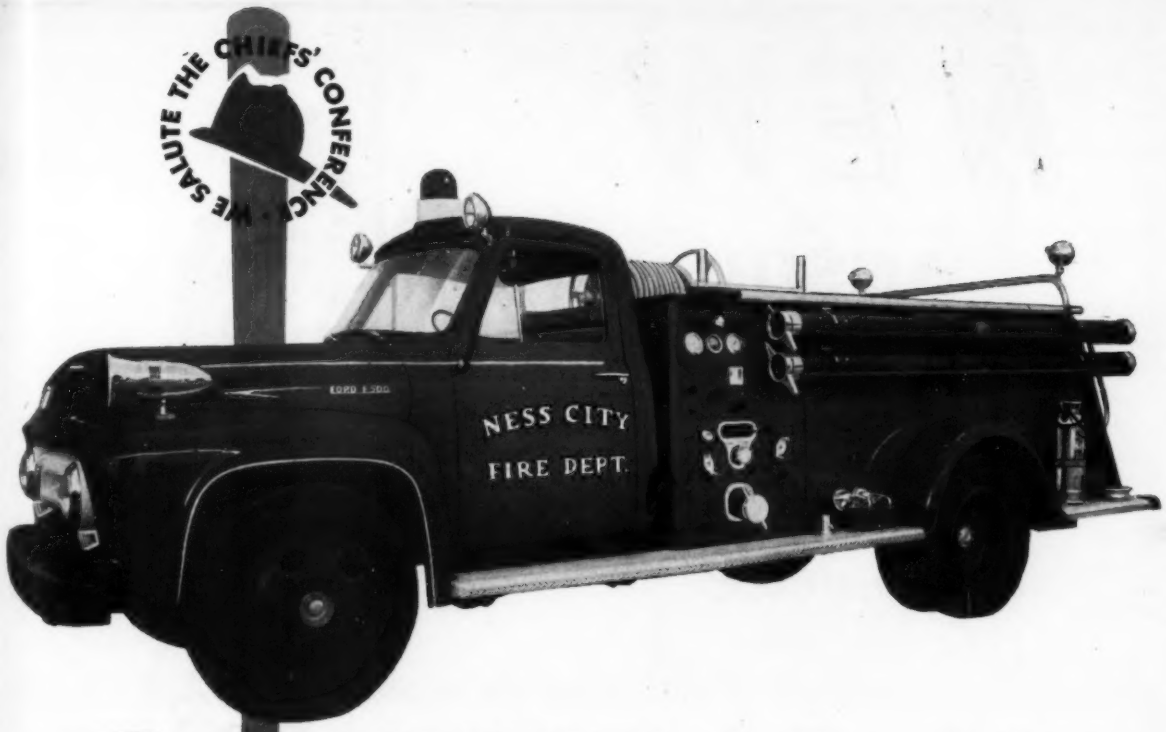
The mother of a three-year-old sent the child outdoors for a switch with which to be punished. After being gone for some time the child finally returned and the mother asked her for the switch.

Between sobs the little one managed to say, "The tree was too high for me to weach, but here's a wock you can frow at me."

Defective wiring has burned many a man out of house and home. A case in mind is the boss who dictated a telegram to his sweetie and his secretary sent it to his wife by mistake.

Two seven-year-olds had just seen a romantic movie. "Wasn't it awful?" said one.

"I didn't think it was so bad," said the other. "During the kissing scenes I just closed my eyes and made believe he was choking her."



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- Two Tanker Models
- Rescue Squad Trucks

Fire fighting requires equipment that is, above all else, *dependable* . . . exactly what BOARDMAN fire trucks are engineered and built to be. The result of more than 20 years' experience, BOARDMAN-Built fire fighting equipment always comes through beautifully in action — never lets you down in emergencies. And better still, BOARDMAN pumpers, tankers and special bodies combine this custom performance with the economy of standard chassis. Using any commercial chassis of your choice means first-cost savings, reduced maintenance costs and a minimum of down time for repairs. From its high-capacity Waterous pump to the very last fitting, every BOARDMAN-Built fire fighter is extra modern, extra dependable—and amazingly economical.

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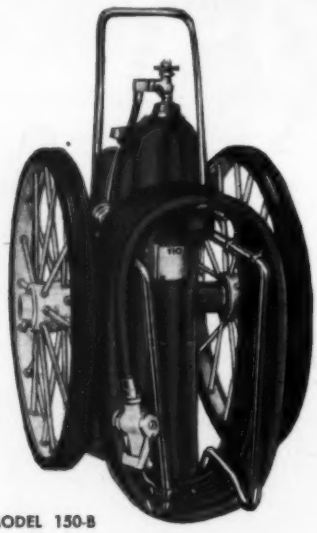

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Ansul "B" Model Wheeled Extinguishers are completely new. Dozens of design changes have improved their operating characteristics as well as their appearance. They provide faster, easier extinguishment of fires almost twice as large as those handled by our "A" model wheeled extinguishers. New Ansul Wheeled Extinguishers are easier to move to the fire. They can be actuated faster. They'll put out more fire faster. They're easier to recharge and maintain. And they will give even more years of trouble-free service.

MODEL 350-B

For a demonstration call your Ansul representative today. Or for additional information send for file number *W-24*.

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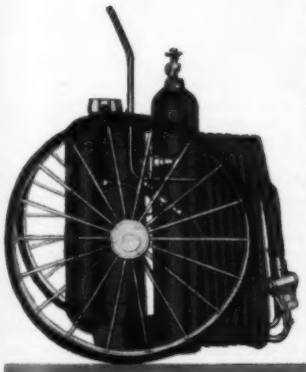

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OFFICES AND DISTRIBUTORS IN PRINCIPAL CITIES IN THE U. S. A., CANADA AND OTHER COUNTRIES

Fire Prevention Week Oct. 4-10

On August 4, President Eisenhower called on the Chamber of Commerce of the United States, the National Fire Waste Council and other organizations to wage a crusade against fires which have cost the nation $1 billion and 10,000 lives in the past year.

The President, in proclaiming October 4-10 as Fire Prevention Week, said "it has been abundantly demonstrated that fire losses can be substantially reduced wherever people are awakened to the danger."

The National Chamber, through its affiliated organization, the National Fire Waste Council, again is taking the lead in planning nationwide observance of Fire Prevention Week.

The program will include community fire prevention education, fire-fighting demonstrations, and inspections of local fire department facilities, industrial plants, commercial buildings, homes and schools.

The bulk of the work for Fire Prevention Week will be carried on by the 37 national organizations affiliated with the National Fire Waste Council and the more than 1,300 fire prevention committees of local chambers of commerce.

"Forest Fire Prevention Week"

Mayor Elmer Robinson of San Francisco, has urged vacationing San Franciscans to regard forest fire prevention as a personal obligation, in a proclamation signed August 8 designating the week beginning August 23 as "Forest Fire Prevention Week."

Convention Dates

Sept. 15-18—INTERNATIONAL ASSOCIATION OF FIRE CHIEFS. Annual meeting, Toronto, Ont. Secretary-Treasurer, Chief Daniel B. Tierney, 8 Robbins Road, Arlington 74, Mass. Headquarters office, Hotel Martinique, Broadway and 32nd Street, New York 1, N. Y.

Sept. 23—OHIO FIRE BRIGADES ASSOCIATION. Meeting at Columbus, Ohio. President, Charles Kuskowski, Station A, Box 66, Columbus, Ohio.

Sept. 26-27—FIRE CHIEFS SCHOOL. Annual meeting, Old Forge, N. Y. For information, write W. Lewis Armstrong, P. O. Box 186, Old Forge, N. Y.

Oct. 2-4—NEW JERSEY STATE FIRE COLLEGE. Annual meeting, Fort Dix, N. J. For information, contact John P. Weeks, President, New Jersey State Fire College, Room 806, 24 Branford Place, Newark 2, N. J.

Oct. 4-9—FIRE INSTRUCTORS' CONFERENCE, to be held at Buffalo, N. Y.; Master Mechanics Section to be held in Elmira, N. Y. For information, contact Training Coordinator, State Division of Safety, 17 Elk Street, Albany 7, N. Y.

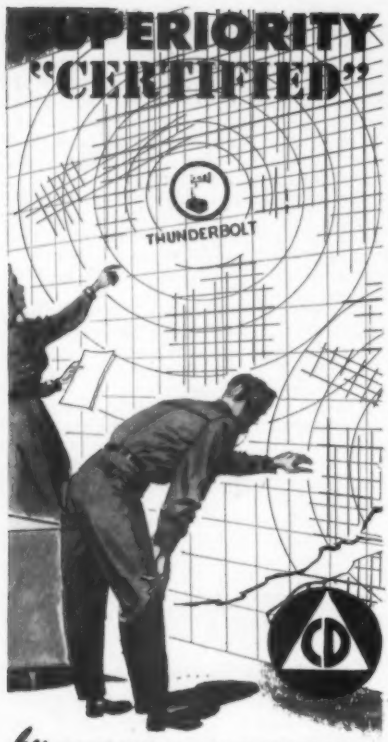
Oct. 5-8 — INTERNATIONAL MUNICIPAL SIGNAL ASSOCIATION. Annual meeting, Columbus, Ohio. Secretary, Irvin Shulsinger, International Municipal Signal Association, 130 West 42nd Street, New York 3, N. Y.

Oct. 14-16—ILLINOIS FIREMEN'S ASSOCIATION. Annual meeting, Bloomington, Ill. Secretary, R. W. Alsip, Box 8, Champaign, Ill.

Oct. 19-21—NEBRASKA STATE VOLUNTEER FIREMEN'S ASSOCIATION. Seventy-first annual meeting, Omaha, Neb. For information, write Russell D. Salak, Secretary-Treasurer, P. O. Box 312, Schuyler, Neb.

Oct. 20-23—KANSAS STATE FIRE SCHOOL. Anual meeting, University of Kansas, Hutchinson, Kans. Director, Gerald Pearson, Director Extension Classes, 111 Fraser Hall, University of Kansas, Lawrence, Kans.

Oct. 30-31—INTERNATIONAL RESCUE AND FIRST AID ASSOCIATION. Annual meeting, Greensboro, N. C. President, Don Luther Gold, Crest Safety Equipment Co., Dunellen, N. J.



by CUSTOMER SATISFACTION

*"In the attack warning system that we have just completed installing, we are using four Thunderbolts and three Federal 2 hp. sirens. We recently ran a full-dress test and were amazed at the coverage. We had but two negative reports in the entire operations. This result exceeded our expectations and planning."

Customer satisfaction, certified by over 337 THUNDERBOLTS *in use* in 225 American cities, assures you that your purchase of Federal Air Raid Warning equipment is wise and economical.

Quantity sales prove nothing *without* satisfied customers; testimonials like the above* point up the increased demand for Federal Air Raid signals over all others. Repeat orders prove that Federal *results* "exceed expectations".

We are proud of the assistance and products we have given our customers, and of the direct contribution to Civilian Defense. We are prepared to give you the same service, backed by a "top quality" product of a firm with over 50 years experience in producing warning signals.

Write for literature on Federal Air Raid sirens today.

*A copy of the letter from which this excerpt was taken is available upon request.

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formerly: Federal Electric Company, Inc.

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The WATCH DESK

Overhauling the firemanic news of the day

by ROI B. WOOLLEY

Likker Is the Root of All Evil

There seems to be something in common between these two items contributed by Irving Johnson. The events took place within a month of each other.

COLORADO SPRINGS, COLO.—A vagrant put in an alarm which probably saved Miss Mildred Frischmeyer, when St. Mary's Church annex caught fire, but he wasn't so helpful otherwise.

Miss Frischmeyer, cook and caretaker for the parish school's nuns, was awakened by the vagrant, and began throwing her belongings out the window. When she threw her purse, he grabbed it and departed.

He was picked up later in a local tavern, drunk, and with $62 of Miss Frischmeyer's $90.

NASHVILLE, TENN.—Policeman Maurice Mellican says Conway Burnett found a new way to start a fire.

Here's how it happened:

Burnett got into an argument with a taxicab driver in front of a liquor store and refused to pay his fare. Then he tore the meter from the cab, stumbled into the store with the meter and fell across a case of liquor.

Liquor splashed against a light bulb in the cab meter and ignited. The fire department put out the fire, and Mellican took Burnett to jail to cool his heels.

* * *

Nothing Like These Fresh Squirts

Over in Clifton, N. J., Ernest Boll told police he was driving along on June 27, last, minding his own business, when some one pulled alongside his car and squirted him in the face with a fire extinguisher.

Brother Boll, who hails from North Bergen, N. J., said he chased the other auto. He was just about to force it to the curb, some two miles down the highway, when he got another squirt of carbon tet' in the face from the extinguisher.

Mr. Boll told police he was so flabbergasted he failed to get the prankster's license number. He also decided to give up the chase! And did.

* * *

Choice Contribits from Lawrence Feihel

MEMPHIS, TENN.—Police said they had a case but it blew up. Officers testified in city court they searched the house of three negroes after getting a tip moonshine was being made there. They overlooked one place—inside the stove.

The location of the jug was soon revealed when an explosion rocked the house. Said the judge—no evidence, no case!

BELLFLOWER, CALIF.—Guess what firemen found ablaze at Bert Van Ruiten's house? His fishpond!

Van Ruiten blamed boys he had scolded for throwing stones in the pool. The blazing gasoline killed all his goldfish.

RIVERSIDE, WASH.—An owl made a wrong turn in Riverside one night and was burned up. So, too, were the firemen.

Seems the night flyer plowed into some high voltage power lines about 10:30 P.M., causing a "short," and electrocuting itself. The carcass fell flaming to the ground. Dried grass caught fire, starting a brisk blaze that brought out the Riverside fire fighters.

WICHITA FALLS, TEXAS—G. W. Worth, Jr., visiting fireman from La Grange, volunteered to go along with the local boys when an alarm came in as he and the lads in the central fire station were "batting the breeze."

Worth is 6 ft. 9 in. tall and claims to be Texas' tallest fireman.

The fire was in a youngster's playhouse. The door was about 3 ft. high. Worth wasn't very much help!

* * *

Paraplegic Vet Is Member of Fire Department

Richard Foley is a paraplegic veteran confined to a wheel chair, but he is also a member of the Fire Department of Needham, Mass., according to the Veterans Administration.

Foley was hit in the spine by shrapnel during World War II. After two years in Army hospitals, he was discharged in a wheel chair in 1948. He was paralyzed from the waist down for life.

Foley attended a business school under the V. A. program for disabled veterans. And now he is what is called a permanent houseman, handling correspondence, keeping records and performing innumerable other duties with the Needham Fire Department.

When there is a fire, he stays on duty in the fire station. Before he went to work, an able-bodied fireman had to remain behind for this job.

* * *

How to "Extinguish" a Rattler

Out Point Mugu, California-way, chemist John Tabor says he's found an effective, if unconventional, way to kill a rattlesnake.

Mr. Tabor stepped outside his laboratory at the Navy's Air Missile Test Center one day early in August and spotted a four-foot rattlesnake. Unable to find a club or weapon, he hurried inside the lab' and grabbed a carbon dioxide fire extinguisher.

He returned with this and, following the proper application technique, in no time at all he had sprayed the reptile with a goodly coating of the CO_2 and frozen it stiff.

Mr. Tabor then picked up the rattler, carried it into the lab' and severed its head with a pair of pliers.

One of the many contribs who sent in this item wrote: "Why didn't he just break the frozen snake in two over his knee!"

* * *

Sees Smoke—Sounds Alarm—Capitol Guard Fired!

Fire alarms in the nation's Capitol, like so many other things in Government, must go through channels. Recently a member of the Capitol Police was suspended for turning in a fire alarm when he saw smoke pouring from a ventilator shaft in Statuary Hall.

Proper procedure, according to the wayward press, is to report to the sergeant or other superior officer if a fire is suspected rather than to turn in an alarm. Guards are expected to fight minor fires themselves.

oops!

Almost had a pretty big blaze. Good thing there was a Kidde CO_2 Portable around. Picked it up, pointed the nozzle, pulled the trigger. That's all. No fire. Hands hardly dirty.

Kidde

Walter Kidde & Company, Inc.

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Walter Kidde & Company of Canada, Ltd., Montreal, P. Q.

The District of Columbia Fire Department objects strenuously to this procedure. Acting Fire Chief Litteral said, apropos the above incident, "We want an alarm turned in as soon as someone smells smoke or sees flames. We like to get to a fire before it has a chance to spread and get away from us."

The suspended policeman reported he was acting from three years experience in the Bethesda-Chevy Chase Rescue Squad. A captain in the Capitol Police said the guard was told not to turn in an alarm but to try and handle the fire himself. The guard was suspended for disobeying orders and later resigned. In apology, the captain said "We try to save the city money and unnecessary trouble. Of course, if we have a real fire, the guards are expected to turn in the alarm. We'd ask for everything in the city."

Incidentally, Chief Litteral said the fire department has no jurisdiction over the Capitol and other Federal Buildings as far as fire inspection and enforcement regulations are concerned. It is said one of the reasons for the policy in delaying alarms at the Capitol is to "avoid disturbing Congressmen and endangering the many pedestrians walking on the Capitol grounds and streets." A few years ago fire apparatus was ordered to stop using Capitol streets for short cuts when answering fire calls, to cut down disturbance and danger.

* * *

It's a Baby Boy to the Kendalls, Via Eng. 15

The "society columns" of Newark, N. J., papers might have printed it this way: A seven-pound bouncing baby boy was born to Mrs. Thomas Kendall at 7:15 A.M. today in the Office of Fire Engine Company 15, Park Avenue and Fifth street. Fire Captain Al Lawson officiated, assisted by Fireman Gerald Kerrigan and supported by the entire station staff. Baby—and firemen are doing well.

The baby's father, a thirty-one-year-old tool designer dashed frantically into the quarters of Engine 15 about 7:00 A.M., Aug. 4th, just as Captain Lawson was going off duty, and asked for "emergency help." He was racing the stork to Columbus Hospital, ten blocks away, but was afraid he couldn't make it in time.

Captain Lawson calmly ordered a cot brought into his office. Then, with Fireman Gerald Kerrigan phoning for hospital aid, he performed the delivery. Ten minutes later a hospital intern arrived with an ambulance and took Mrs. Kendall and her new son, both "in fine shape" to the hospital.

The Kendall's have another boy, aged three. Captain Lawson, who is married but has no children, noted: "We firemen have to be able to handle all sorts of emergencies."

Thanks FRANK CORVILLE

* * *

Talk About Your Iron Curtains!

Here is an account of an incident that happened to some of the Brothers in Pittsfield, Mass., recently. Contrib' W. A. Montgomery of Springfield submits it for the edification of our readers.

"The firemen of the West Pittsfield fire station received word of a cellar fire in their district. They rapidly donned their turnouts and mounted their truck. The driver started the engine and, when they were ready to roll, Lieutenant Charles H. Heno pulled the rope to open the station's electric door.

"Nothing happened! He then jumped off the truck and tried two wall switches —but still the doors refused to budge.

"At this point, he pulled the emergency cord on the controls—and it broke. Not to admit defeat, the lieutenant then rustled up a step ladder, and tried to grab the short end of the broken rope, but this got tangled in the overhead mechanism of the door opener. And the door still wouldn't open far enough to permit exit of the apparatus.

"Finally, in desperation, the lieutenant called the fire alarm station and another piece of apparatus was dispatched to the fire. All this was done in a matter of seconds. Luckily the doors of the second fire station opened correctly when called upon."

Talk about your iron curtains!

* * *

Television "Gets the Bird"

Even television service men have their troubles with their TV sets—but not all are lucky enough to have pet parakeets to warn them of the trouble!

At an early hour on August 1, Ernest Koteles, a television repairman in Bridgeport, Conn., was awakened by the fluttering and chirping of his parakeets. Mr. Koteles' three parakeets are caged not far from the television set, and on investigation he discovered his 20-inch set ablaze.

The fire was not of serious nature, and he put it out with a hand extinguisher. Mr. Koteles credits his parakeets for saving his house.

Thanks, TOM MAGNER.

Catalog No. 150

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*QUICK RELEASE FEATURE—Both clamps can be released with only one motion.

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Former Deputy Chief,
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and FRED SHEPPERD

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in Collaboration with the Educational Committee of the International Association of Fire Chiefs

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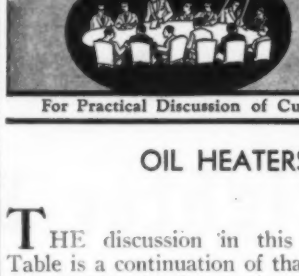

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For Practical Discussion of Current Fire Department and Fire Management Problems

OIL HEATERS—DEFINITELY A HAZARD!

THE discussion in this Round Table is a continuation of that which appeared in the August issue on the hazards of oil heaters.

The generous response from our readers made it necessary to carry the discussion over to this issue.

Readers are invited to send in their comments on this subject or on next month's subject which is described in a box on a subsequent page. Address replies to Round Table Editor, FIRE ENGINEERING, 24 West 40th Street, New York 18, N. Y.

Discussion of the Question

O. B. Spruill, Chief, Columbus, Miss.: The last death we had in our city as a result of a fire caused by an oil burning heating device happened in 1941. This was caused by the careless handling of a portable oil stove. The woman had not fastened the catch on the base of the stove.

We have an ordinance on open flame heating device which reads as follows: "All gas, gasoline, oil or charcoal burning stoves or heating devices shall be placed on iron stands at least six inches above combustible supports unless the burners are at least five inches above the base with metal guard plates four inches below the burners. No open flame heating device shall be placed in any room where volatile flammable fluids are kept or stored."

We make periodic inspections and rigidly enforce the above ordinance. We also carry on an education program.

Bruce Martin, Chief, Martinsburg, W. Va.: In 1951 we had a fire in a trailer where five children perished. The children's mother locked them in and the children are supposed to have lighted an oil or gasoline stove to warm themselves.

In 1952 we had a fire in a tourist cabin just outside of town where an intoxicated man perished. Cause of the fire was unknown, but there was an oil stove in the cabin.

The city has no law governing the use or maintenance of oil stoves. Oil burning furnaces have to be installed according to NBFU Pamphlet No. 11.

I believe the public must be educated in the proper use and maintenance of oil burning stoves. The oil companies who distribute the oil to stores and homes could distribute a pamphlet or handbook on proper maintenance of these stoves. In this way the public could be educated on the proper care of stoves so the fear of fire in their homes would be partially eliminated and the oil companies would have a happier and more satisfied customer.

You can't make a person read anything he doesn't want to read. The fire department could do a good job of fire prevention if men were available and time permitted to contact each home user of oil and instruct them in the do's and don'ts of oil burning equipment.

Emil A. Johnson, Chief, Boulder, Colo.: We have not had any fatalities from oil stoves in the past two or three years. The fire department has control over their installation.

We have had some flare-up in oil stoves, caused by overflowing and clogged burners.

We do not have many oil stoves, as natural gas is mostly used. Most of them are in trailer houses and quonset huts (temporary housing at the University of Colorado).

Stoves must be installed properly and the burners kept clean. Gravity feed lines should not be used.

M. H. McKie, Chief, Moncton, N. B.: We have had no fatalities from oil stoves.

We do not have any control of these units at the present time, but are awaiting the approval of our law and legislative committee to make it compulsory for oil heating units of all types to be inspected by our depart-

HERE IS THE QUESTION

Statistics show oil stoves (used for room heating) to be one of the major causes of deaths by fire in this country.

What has been the experience of your department insofar as fires of this type are concerned:

a. Have you had any in the past two or three years which have resulted in fatalities?

b. Has the fire department (or city) any control over the use or maintenance of oil stoves?

c. If you have had no fires originating in oil stoves, how has this been accomplished?

d. What, in your opinion, is the most effective means of reducing the number of fires from oil stoves?

ment before being placed in operation.

In our experience with oil stoves for room heating, we have found the greatest trouble is from the operator not knowing how to keep these units cleaned and further, that they will allow flooding of the burner before lighting it. In summing up this situation, we do not have too much trouble from the companies making the installation, but rather from the owner in careless operation of the unit.

Harold Doherty, Chief, Fredericton, N. B.: Our experience with this type of fire call has been the same as other localities. These calls are gaining every year. I put the causes of these fires in three categories: 1. Improper installation; 2. Home amateur jobs of manufacture and installation and 3. The telephone. In the last case the oil is turned on and the phone rings and is answered and a long conversation results. The stove is finally thought of and the match applied, with the result, a flooded pot. We have had this explanation given us on a number of occasions. The whole situation boils down to ignorance on the part of most users of oil burning equipment, as to the necessity of maintenance and regular check-ups the same as with any other type of heating fuel.

We have had no fatalities but have had our share of fires.

In my opinion, I think the one sure way of getting a reduction in these oil stove fires is to get the full cooperation of all oil companies and the manufacturers of oil burning equipment to start an all-out educational program for the general public on the use and care of this equipment and to drive home to all users that this equipment, like all other types, must always be kept in good working condition by regular check-ups and cleaning. In many cases, and in many areas, the oil burners are a comparative new type of stove and the people are taking too much for granted. Some of the salesmen are not above rooting the idea that they are so efficient that they do not need to be looked after at all.

R. G. Armstrong, Chief, Sarnia, Ont.: In Sarnia we have approximately 1,000 space oil heaters. We have had very little trouble with them. We have had no fatalities and only one serious dwelling fire in the past two years.

We have a city by-law governing the installation of oil heaters and the storage of oil.

I believe that with proper installation and care, oil space heaters are quite safe.

Ivo Borg, Chief, Logan, Utah: We have had no fatalities in our city or county from fires caused by space heaters, but have had a number of fires but no large losses.

We require a permit for the installation of any tank connected therewith. Each installation is carefully inspected.

It appears to me that most of our fires from oil stoves have been the result of ignorance on the part of the owner or operator. I find that very little instructional work is done by retailers when a new installation is delivered. I feel that retailers should fully instruct their customers on operation and hazards of the unit.

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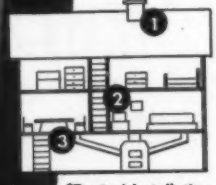

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HERE IS THE QUESTION FOR THE NEXT ISSUE

1. **What safeguards are required where fuel oil tanks of large capacity are installed underground in high value congested districts?**
2. **Who grants licenses, or permits, for such installations?**
3. **Are special fire protection facilities required in buildings served by such installations? If so, what fire protection facilities?**
4. **What powers, if any, has the Chief of Fire Department with regard to controlling hazards created by such installations?**

maintenance appears to be evident to a greater extent on this type of installation than on the average good heating or furnace installation.

W. G. Haney, Chief, Hoquiam, Wash.: We have had no fatalities from this type of fire, but have had a considerable number of fires. However, very few have gotten beyond the stove itself.

We have no ordinance covering these except the installation of tanks.

We try to educate the public to be careful in lighting these stoves and also in keeping them clean. We find that nearly all oil stove fires are caused either from dirty stoves and pipes or from not lighting them after turning on the oil and letting them become filled, with the result that an explosion occurs when a match is applied.

Brett Basham, Chief, Bowling Green, Ky.: We have had some oil stove fires but no fatalities.

My experience with oil stoves, both heating and cooking, where fire has occurred, is that the trouble can always be traced to the fact that the stove was lighted with the generator or burner being cold, and in order to get the proper height flame the burner must be turned very high. Then the stove is left unattended while the burner is warming up, the burner becoming more efficient, which results in too much fuel and the flame continuing to increase in height until walls or ceiling are afire. Burners in oil stoves must be kept very clean at all times to allow proper operation of the stove.

I believe an educational program in the schools and on P.T.A. programs and closer watch on fuel trucks to see that they do not deliver contaminated fuel, will help to reduce these fires.

Clifford R. Carpenter, Chief, Fort Collins, Colo.: From January 1, 1951 to the present date we have had six fires resulting from oil fired room heaters, none of which caused any deaths or injuries.

We have a certain amount of control over the maintenance of oil heaters and cook stoves if a fire hazard is caused because of them.

I noted in our reports of previous

fires caused from oil stoves or heaters that the main reason for the fires seemed to be the overflowing of oil. I believe that oil heaters should be equipped with an automatic shut-off which has been tested and approved by Underwriters' Laboratories.

Clare P. Kern, Chief, Missoula, Mont.: In the history of this department there have been no deaths caused by oil stoves. At present there is no ordinance giving any control over the installation and maintenance of this type of heating equipment.

We have a good many calls for hot oil stoves. Last year we had 275 alarms and 25 of them were for hot oil stoves. Very little damage was done, however.

Proper installation, maintenance and regular cleaning of chimney, smoke pipe and the stove itself, will help to reduce the number of fires from this cause.

J. Coleman Miller, Chief, Auburn, Maine: We have not had any fatalities from these fires, but we have had multiple alarms and men injured fighting these fires.

Each installation is inspected by the Chief of the fire department.

Proper installation, inspection and education of the public as to how to attend to and light burner will help reduce the number of such fires. We find that seventy-five per cent of the fires comes from flooding, because the owner forgets that it was turned on.

Claude J. Highstead, Chief, New Westminster, B. C.: We have not had any fatalities from this type of fire.

We have rigid installation regulations covering these stoves.

I believe public education, plus definite printed instructions accompanying equipment when sold and installed will help to reduce these fires.

In British Columbia, permits must be taken out prior to installation, and inspections are made by the fire department prior to operation.

W. L. Cook, Chief, Moose Jaw, Sask.: There have been no fatalities in this city from oil burners during my thirty years' experience here.

Carelessness by persons who have gravity flow oil burners in not keeping the burner clean of carbon and allowing the burner to flood before lighting is the chief cause of these fires. We have had one building fire from this cause.

The Government of Saskatchewan has regulations governing the installation of oil burners. Oil burners must be installed by qualified licensed installers in compliance with regulations. Permits to install each burner are issued to the installer by fire departments or by the Secretary of Rural Municipalities.

I believe these burners should carry an inspection label of the Underwriters Laboratories, the National Research Council, Canadian Standards Association or the laboratories of the Associated Factory Mutual Fire Insurance Companies before the burner is installed. The people operating such burners should be instructed in the care and operation, especially with the circulator heater used to heat living rooms. These are the burners which give the most trouble and require the most attention.

Donald J. Rayburn, Chief, El Dorado, Kans.: Twenty or thirty years ago we had quite a number of oil stoves in use in this community, but we never have

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had a fatality resulting from fires of this type.

About 99 per cent of our heating and cooking equipment is either natural gas or electricity and about the only equipment used other than these two are the butane or propane installations on trailers in registered trailer courts. No butane or propane installations are allowed in private homes or mercantile buildings.

Alex Andreski, Chief, Janesville, Wis.: We have had mostly flare-ups causing fire scares only. However, we have had only three or four fires from homemade affairs.

We have a city ordinance which controls all heating installations in the city.

The fires which have caused damage were from faulty installations. Instructions are given for proper installation.

I believe public education through inspections annually by members of the fire department, rigid fire inspections in the fire limits, forceful regulations where the general public's safety is concerned and education as to the home owner's own responsibility for safe practices in his home will help to reduce the number of these fires.

E. W. Cole, Chief, Rock Hill, S. C.: We have a lot of fires starting from oil stoves. On December 21, 1952, one man burned to death in a fire believed to have started from a two-burner portable oil heater. On March 4, 1953, a man received burns from an oil heater and is still in the hospital.

In the month of May we had six out of fifty fires started from oil heaters or oil cook stoves. In the month of June, three out of thirty-nine calls were for the same type of fire.

I believe that if in the fire prevention program we would stress the danger of oil heating equipment, more precautions would be taken, i.e.:

1. Be sure that there is not too much oil in the burning bowl before lighting.

2. Don't leave the wick type burner until it is burning steadily.

3. A leaking unit of any type should not be used.

We have control over the installation of tanks, but no control over the smaller heating and cooking units.

Walter Buffington, Chief, Xenia, Ohio: We have had a large number of fires from oil heaters but have had no fatalities.

The only control we have is condemnation.

We find that mild weather causes stoves to carbon fast and a sudden cold spell fires the carbon deposit thereby causing explosion or flooding.

Walter R. Messer, Chief, Keene, N. H.: We have fires in and from space heaters, but no fatalities.

We have no control over these units other than suggestive maintenance. We do have control of storage of oil as to location and amounts.

I believe education of the user in the way of easy to read instructions for installation, operation and maintenance from the manufacturer, would help to reduce these fires.

Brice G. Kinnamon, Chief, Rescue Fire Co., Cambridge, Md.: I am of the opinion that most oil stove fires are caused by flooding of the burner pot. This is sometimes due to carelessness in not lighting the burner soon enough or by faulty draft from the chimney not allowing the oil to burn properly.

I believe that an overflow pipe from the burner back to the carburetor would help reduce this hazard.

Hugh Riley, Chief, Hibbing, Minn.: We had one death from this cause in 1952. We answer at least 25 fire calls a year for oil stoves.

We are seeking an ordinance which will give us authority to inspect installations of both oil stoves and oil furnaces, inspections to be paid by the home owner.

Education of the home owner on the proper operation of an approved oil stove; frequent cleaning; periodically and proper inspection of the float and regulating equipment to insure proper operation will help to reduce fires from this cause. Then too, only first quality fuel oil should be purchased from a competent distributor.

W. H. Short, Chief, Lethbridge, Alta.: We have had no fatalities from oil stove fires. We are fortunate to have natural gas as a fuel and the use of oil stoves is almost non-existent.

We do not have any regulations covering installations of these stoves, but there are Provincial regulations. I believe strict observance of the regulation of standards as recommended by the N. F. P. A. on small heating and cooking apparatus will help to reduce the number of these fires.

The element of fire hazard will always be present with the use of portable heating stove, and it would appear to me that one safeguard should be that the use of same should be restricted in any highly combustible location.

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Don Hayne, Chief, Albany, Ore.: In this locality we have had our share of oil stove fires. We have not had any fatalities from this cause for the last three years, however.

The only control we have is the time of purchase in local stores. We have no way of checking sales outside of our city.

The most effective way to reduce these fires is by education of the homeowner as to proper installation, location, etc. In most cases the owner tries to cut down the cost by running the stove low. This causes the unit to carbon up.

George Kennedy, Chief, Chatham, Ont.: We have had no fatalities as a result of oil stove fires.

A by-law has been passed by our city council to regulate the use of oil burning equipment within the limits of the City of Chatham. This by-law provides that no person shall install any oil burning equipment, or an oil burner, or make any alteration of or addition to an existing oil burner without first obtaining from the fire inspector a permit to make such installations, said installation to be installed according to the regulations of the Fire Underwriters and approved by our local fire inspector.

We have one or two small fires in oil burning equipment, but none of any serious nature.

I believe such a by-law will help to reduce the number of these fires.

Ira J. Stockwell, Chief, Carlsbad, N. M.: We have had one fatality from fire caused by an oil stove.

We have no controls over the use or maintenance of these stoves.

I believe education of the public as to the danger of using oil and the necessity for safe handling, would help reduce the number of these fires.

Alfred Turner, Chief, Prince Albert, Sask.: So far we have not had a fire which was caused by an oil burning stove of any sort. The fire department issues a permit to anyone installing an oil burner and unless it is an approved type, that is, approved by the Underwriters' Laboratories or the Canadian Standards Association, we will not permit its use. We also inspect the installation which must be done by a licensed installer. These are Provincial regulations and must be strictly enforced in the Province of Saskatchewan. I believe that the above regulations go a long way to reducing fires in oil burning appliances.

Norfolk Tops State in Fire Prevention

Norfolk, Virginia was awarded first prize, by the Virginia Association of Insurance Agents for the best fire prevention program of the year.

The presentation was made by John Cahill, Jr., of John Cahill Insurance Agency of Norfolk. Incidently this contest was originated several years ago, as a yearly event, by Mr. Cahill. Chief Woolard of the Norfolk Fire Department, accepted the award.

The ceremony took place during the Virginia State Fire Chiefs Convention held at Old Point Comfort, Virginia.

At this time Mr. C. H. Dougherty of Franklin, Va. was elected President of the Virginia State Fire Chiefs Association. He succeeds Mr. C. E. Carlson, of West Point, Virginia.

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MONITORADIO

Among the Buffs

By Paul C. Ditzel

FOREIGN postmarks have been on much of the firefan mail received this month. Others wrote to comment on anecdotes of foreign fire brigades and their blazebeating tactics which I've described in recent columns.

One of the most interesting and undoubtedly the longest foreign letter received was from Joseph Van Humbeeck, 15, rue Fr. J. Navez, Brussels III, Belgium. Van is a member of the Brussels Fire Brigade and sent along information on his department, some pertinent parts of which I'm taking the liberty of quoting:

"Apart from a few exceptions, our 13,000 hydrants are all underground (outlets are flush with the pavement) unfortunately for us. We would rather have our hydrants above ground level because they would be more visible at night. Pressure is between 90 and 115 pounds per square inch and besides hydrants we have many water points from rivers and lakes. A canal, eight miles long, runs through town and provides an inexhaustible water supply.

"We do not have any street box alarms. (This idea is raising quite a controversy in England where street box alarms are being removed.)

"Our fire apparatus includes two high pressure fire units, each equipped with a 450 gallon water tank, a midship Barton pump of 500 gallons delivery, two high pressure hose reels (180 feet) two cylinders of 80 pounds CO_2, a 22-gallon foam compound tank, hose reels of 2-inch and 2½-inch rubber-lined hose, a Davy fire escape, one ladder, gas mask and other equipment.

"We also have two aerial ladders, one a mechanical Magirus (old type) and one automatic Metz ladder (100 feet.) Then we have one closed type pumper with a front mounted pump (600 gal. per minute) and a 40-foot ladder in 5 sections.

"Our equipment also includes two hose wagons but these are not equipped with water tank or high pressure pump but, instead, carry a portable pump, hose reels and miscellaneous equipment.

"We have one salvage truck and/or rescue unit which is used for salvage of animals trapped in excavations, salvage of people in wells, street accidents, etc. Lastly, we have two ambulances, each equipped with stretchers, blankets, etc.

"Five of these vehicles are radio-equipped with two-way Motorola transmitters-receivers having a range of 20 miles and 25 watt power. Our local police station is connected to our radio system and correspond with their squad cars through our channel.

"We must admit that, for many years now, the high pressure and radio equipment are the most notable progress made in fire fighting.

"Our fire engines are painted white and red for the past two years and these colors are more visible day and night. Turnouts are made in 30 seconds after the alarm is sounded. We have two platoons of 30 men which relieve each other every day.

"Our fire activities for 1952 included 101 fires of all kinds, 16 false alarms, 51 chimney fires and our ambulances carried 457 persons injured in auto accidents and removed 541 other sick people."

Van, who writes exceptionally good English, would enjoy hearing from fans and firemen around the United States. He's an excellent correspondent too, I might add, and sent along some historical shots of the Brussels brigade which are truly collector's items.

From Salzburg, Austria, our good correspondent and world traveler, John W. Fiedler, RA35488950, 544 Quartermaster Co., APO 541, c/o Postmaster, N. Y., N. Y., tells of receiving a letter from a "fan" who insisted that EVERY box alarm in the Chicago Stockyards area automatically called out a 4-11 assignment. Will the legends surrounding Chicago never cease, Johnny wonders.

Here's what Brer Fiedler has to say about a Sunday visit to Munich:

"Their apparatus is painted bright red and have American made sirens. In Germany a first alarm assignment is called a 'Loschzug' (losch means to quench, or extinguish, and zug means train). An extinguishment train consists of a chief's car (PKW), tankspritzer (large booster tank), spritze (pumper) and a maschenleiterwagen (aerial ladder). When they need help, instead of sounding a second alarm, they call for one or two or three Loschzugen as necessary. The Hauptfeuerwache (fire headquarters) has three Loschzugs the other Feuer Waches have either two, or one, Loschzugs."

I'll pause now for the unfortunate chap who has to set the above paragraph

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on Linotype and for the proofreader to catch their breath and unravel their alphabet. (Maybe the typesetter and the proofreader should be getting a special foreign language differential for the above paragraph. My apologies, kind sirs!)

Back in this country, again, I find mail or postcards from the following:

The Rev. Wilson Davis of Ridgely, Md., who says he's "fireman and buff, too" wants to know why this column isn't listed in Fire Engineering's table of contents. (It is, but one of those gremlins left it out one month.) Rev. Davis also reminds us that the Lafayette Volunteer Fire Co., in Lancaster County, Pa., has an orange-colored truck. "If I see a purple one (as mentioned in one of my recent columns) I'll switch from cokes to H_2O," says the good clergyman! I'm still waiting to hear from someone who knows where that purple rig ended up.

A. (Smokestack) Hardy sends his best wishes to the new and powerful voice in the Ditzel family—Denise Michele who fell fast asleep recently while watching a two-alarmer here in Hollywood. She's now five months old and is more interested in the capacity of her baby bottle than the booster tank on Engine 52.

Thomas J. Dworman, 951 Whitmore Rd., Detroit, 3, Mich., writes so he can "brag" about his favorite department: Detroit, what else? Tom says the average age of Detroit's equipment is eight years and "modernization is probably an important factor in the Detroit fire department's efficiency."

Albert H. Redles, secretary of Bachmann Bros. Inc. (the company that makes those scale model plastic firehouses) said he visited Fire Insurance Patrol No. 1 recently in Chicago. He says he took in 15 runs while in Chicago and says that as of July 23, 1953, his total number of responses since 1925 is 20,620. Al tallies all his turnouts in a notebook he keeps with him at all times.

"I also had a fine visit with the Milwaukee Fire Department and only hope that I will be able to help our own Philadelphia Fire Dept. gain further strides going up the ladder of progress," says Al who is reachable at 1400-1438 East Erie Ave., Philadelphia 24.

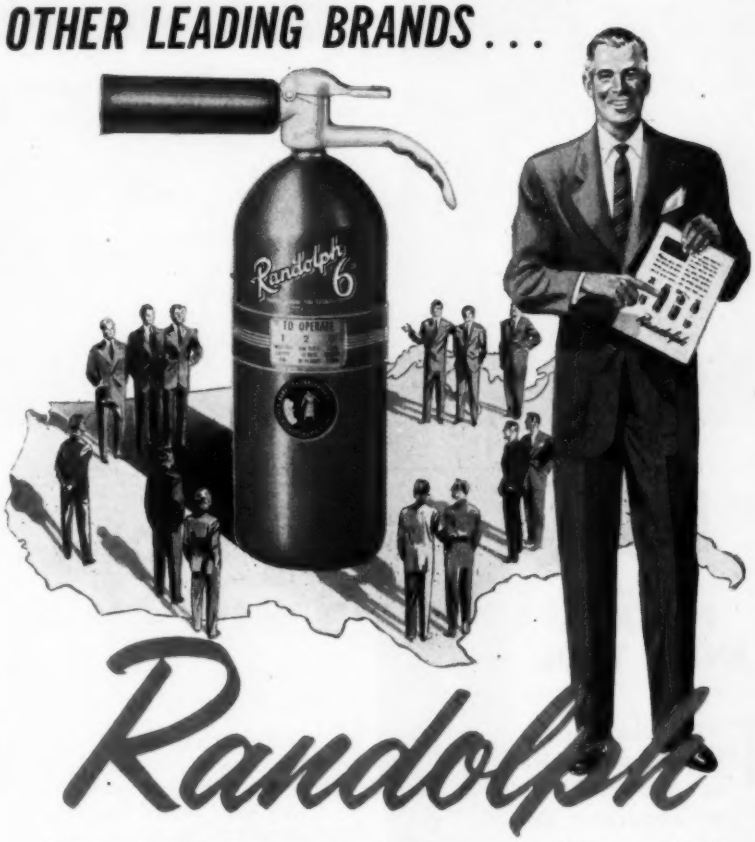
Striking it out for another month, I want to thank those of you who took the time to write telling me how much you enjoy this column and FIRE ENGINEERING MAGAZINE. Sorry I can't answer all your letters immediately, but I'll try to do better. In the meantime, keep sending along your fire anecdotes, especially those involving fans you know—or maybe even you! The address: 1246 Tamarind Ave., Hollywood 38, Calif. Or you can try me at Paul Ditzel, Labor Editor, Los Angeles Daily News, Los Angeles 54, Calif.

Jersey Bans Flammable Clothing

In July, legislation aimed at eliminating the sale of highly flammable apparel in New Jersey was signed by Gov. Alfred E. Driscoll.

The law, which goes into effect Jan. 1, 1954, provides for state regulation and testing of any apparel or fabric suspected of being dangerous when worn. Aimed specifically at the so-called "torch sweaters" and "cowboy suits," the law provides for fines ranging from $200 to $1,000 for violators.

HERE'S THE EXTINGUISHER YOU PICKED AS "EASIEST TO USE" OVER THREE OTHER LEADING BRANDS . . .



Randolph

Safety and Plant Engineers—here's how you voted: In a national survey recently completed, 100% of your replies stressed *ease of operation* as a major factor in Extinguisher selection. And on the basis of being "easiest to use", 86% of your replies specified Randolph over the nearest brand—66% specified Randolph over *three* other leading brands, *combined!*

With no nozzles to adjust, no valves to turn, Randolph Extinguishers are 100% panic-proof. Just snap from the bracket, aim and press the trigger. You KNOW how to use this extinguisher *just by looking at it!*

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Randolph SIMPLIFIED FIRE EQUIPMENT

The EK HOOK
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The MODERN PIKE POLE and FORCIBLE ENTRY TOOL

H

THIS tool outmodes the old pike poles as effectively as motor apparatus replaced horse drawn wagons. It's a mean, modern, miracle of a tool. It's tough! Made of chrome nickel molybdenum alloy steel — heat treated, ground and sharpened.

(Working Points Indicated by Letters)

A—PENETRATION
B—PENETRATION and LEVERAGE
C—CUTTING
D—CUTTING
E—EDGE
F—BLADE and FULCRUM
H—HANDLE

It is far more efficient and has more utility than any other tool of its type designed for demolition, ventilation and forcible entry for all Fire Department and Civilian Defense Units.

Weight with 6' handle 7½ lbs.

Up to 6' **$24.85**

Longer length at 85¢ per ft. additional.

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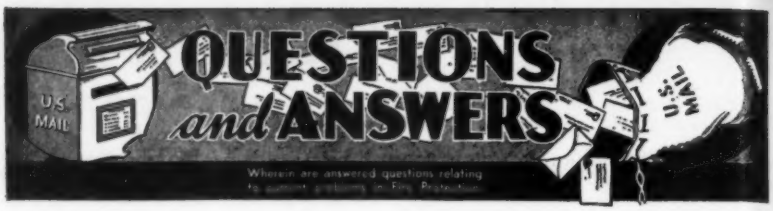


Centrifugal Pump Capacity at Different Pressures

To the Editor:

We have in our engine house a 1951 centrifugal pumper with a rated capacity of 750 GPM, 150 pounds engine pressure at 1,690 R.P.M. During house drill, a question was asked, namely, "How many hand lines employing a 1¼-inch tip with 50 pounds nozzle pressure could be taken off the pump? Using formulae from "Fire Service Hydraulics," I said three such lines could be used. Is the following correct?

$$\frac{150 \text{ lbs. R. P.} \times 750 \text{ GPM (R.C.)}}{1715} =$$

65 water h.p. (app.) needed to discharge 750 GPM at 150 lbs. E.P.

$$\frac{150 \text{ lbs. R. P.} \times 750 \text{ GPM (R.C.)}}{100 \text{ lbs. E.P.}} =$$

1,125 GPM (app.) that would be discharged at 100 lbs. E.P.

A 1¼-inch tip on a 2½-inch line at 50 lbs. nozzle pressure would discharge approximately 325 GPM.

Three lines would discharge 3 × 325, or 975 GPM.

The friction loss in one line discharging 325 GPM would be $2(3.25)^2 + 3.25$, or approximately 24 lbs. per 100 feet.

In the line is 200 feet long, 48 lbs. of friction loss would result. We then would have 50 lbs. N.P. + 48 lbs. F. L., or 98 pounds.

To sum it up, the pump operating at 100 lbs. E.P. would be capable of discharging 1,125 GPM approximately and also capable of maintaining 50 lbs. N. P. if the lines are kept 200 feet in length or shorter.

The water horsepower needed for 975 GPM discharge from three such lines is:

975 GPM × 8.23 = 8,141 pounds per minute × 230.4 head at 100 lbs. E.P., or 1,875,686 foot-pounds per minute approximately.

1,875,686 ÷ 33,000 = 56 water horsepower approximately.

Question 2. Must the length of the lines be known or is 50 lbs. nozzle pressure sufficient to determine this problem?

Question 3. Using three lines as mentioned in previous problem, 200 feet long, 1¼-inch tip and 50 lbs. nozzle pressure, would the RPM's be excessive to prohibit their use?

Question 4. This pump is rated 60 horsepower S.A.E. and 215-235 brake horsepower. What is the difference between each? Are both horsepowers numerically equivalent to 33,000 foot-pounds of work per minute?

Question 5. On what types of fires would a high velocity and a low velocity fog be used?

J. W. M.

Answer 1: The method you employ for determining the number of lines of 2½-inch hose equipped with 1¼-inch tips at 50 pounds nozzle pressure, is theoretically correct. However, several factors enter into the solution which have a material bearing upon the discharge of a centrifugal pumper at pressures much below rated pressure.

Some of these factors include speed limitation, friction of water in the pump, and adequacy of supply of water.

Another factor which also has a bearing is the efficiency of the pump at low pressures.

If the discharge pressure is not materially below the rated discharge pressure, the formulas hold fairly well.

However, in solving for the number of lines the engine could supply, the length of each line must be known. For example, if each line were 400 feet long, then the pump would be operating at approximately rated pressure. Under these conditions, the maximum discharge that could be expected from the pump would be its rated discharge.

Assuming the lines are 400 feet long each, and that each is equipped with 1¼-inch tip at 50 pounds nozzle pressure. The discharge from each line will then be 326 gallons per minute.

Friction loss between the pumper and the nozzle will be 150—50, or 100 pounds. The friction loss in 100 feet of 2½-inch hose at a flow of 326 gallons per minute is approximately 24.6 pounds; the friction loss for 400 feet would then be 96.4 pounds, or 98 pounds approximately. The engine pressure would then be 98 + 50, or 148 pounds. The number of lines the pumper could supply would be 750 ÷ 326, or 2 lines.

Answer 2. Yes, the length of lines must be known before the problem can be solved.

Answer 3. The R. P. M. would be increased, and possibly to a point where continuous operation at this speed might be harmful.

Answer 4. S. A. E. horsepower is based upon several factors, but, in its simplest form, the formula is as follows:

$$\text{SAE H. P.} = \frac{d^2 N}{2.5}$$

D is the diameter of cylinder bore, and N, the number of cylinders.

Thus S. A. E. horsepower is actually proportional to diameter and number of cylinders.

Brake horsepower, on the other hand, is determined by the use of a dynamometer or prony brake, and is actually the power delivered by the motor under the operating conditions applied. The latter is, of course, the more accurate figure.

Answer 5. There is still considerable controversy over high velocity and low velocity fog, and until some of the research being conducted on the various types of fog, and fog nozzles, has been completed, there will be no authentic answer.

Pump Discharge at Higher Pressure

To the Editor:

Our rotary gear pumps are eight teeth rotors, one being driven by the motor and the other by the driven gear. When pumping in capacity gear, the pump turns over at a certain speed. Changing to pressure at the same motor speed, the speed of the pump is reduced. I would appreciate your giving me an explanation of this fact.

W. P. M.

Answer: Before we attempt to explain the purpose of reducing the speed of a pump where the pressure is to be increased, it is necessary to say something about water horsepower.

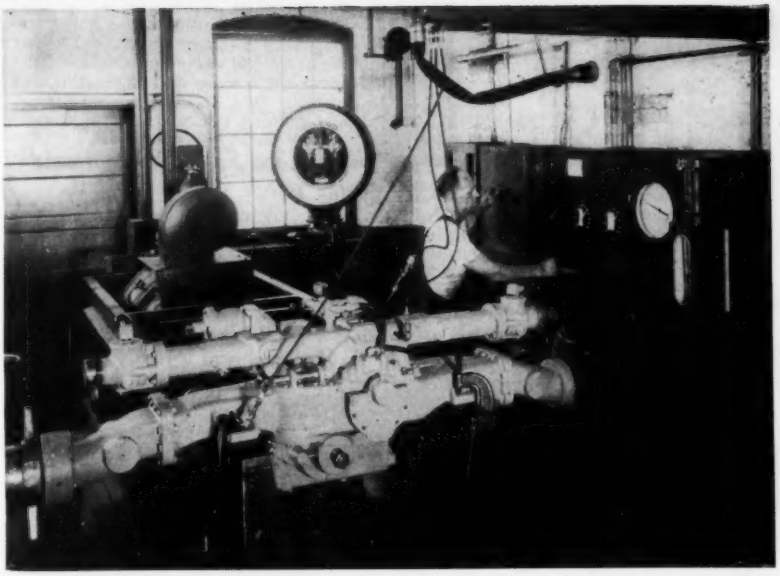
When a one-pound weight is lifted vertically a distance of one foot, the work done is termed a foot-pound. If 10 pounds are lifted one foot vertically, ten foot-pounds of work are done. If 100 pounds are lifted vertically a distance of 10 feet, 10 x 100, 1,000 foot-pounds of work are done.

Power is the rate of doing work. For instance, if a machine is capable of lifting 33,000 pounds through a vertical distance of 1 foot in a minute, that machine possesses 1 horsepower. In other words, one horsepower is that power which a machine possesses when it is able to do 33,000 foot-pounds of work a minute, or 550 foot-pounds of work a second.

Based upon the above basic data, a formula has been devised for determining the water horsepower of a pump, delivering water under pressure. This consists of multiplying the discharge pressure in pounds per square inch by the discharge in gallons per minute and dividing the product by 1,714. The answer is the water horsepower.

For example, if we want to find the water horsepower of a pump which is discharging 700 gallons per minute against a pressure of 120 pounds per square inch, we multiply 700 by 120 and divide the product by 1,714, which gives us 49 horsepower approximately.

Now, if we want to deliver the water at twice the discharge pressure, 240 pounds, and assuming that the engine would operate to get its full power when discharging 700 gallons at 120 pounds, we will find that we can discharge but half the quantity of water at twice the discharge pressure. This can be secured by using the above formula, but placing



CA-5 750 GPM fire pump undergoing final test on one of WATEROUS' 3 test stands

Proof of the Pump Is the Final Test

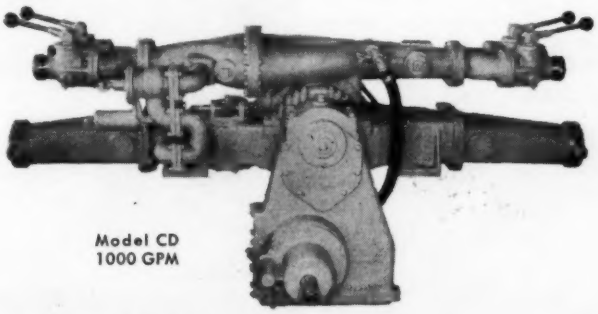
● Each WATEROUS pump is subjected to a rigorous test before leaving the factory.

In a modern test stand like the one shown above, pressure and efficiency are checked under contract requirements for capacity.

Throughout the test, performance is observed closely. Several different instruments tell exactly what is happening inside the pump, and give the testing engineer continuous readings of speed, capacity, horsepower, temperature, and pressure.

This is only one of the means by which WATEROUS assures its users of dependable performance. Behind this final test lies a 66 year story of painstaking research, improvement in design, and precision workmanship. Together, these have produced a line of fire pumps that is outstanding for ease of operation, simplicity and accessibility of parts, and utmost dependability.

If you are in the market for new pumping equipment, you will find "Preferred Fire Pump Specifications" a handy and valuable guide. For your free copy, write WATEROUS COMPANY, 80 Fillmore Avenue East, Saint Paul 1, Minnesota.



Model CD
1000 GPM

Waterous
DEPENDABLE PUMPS
SINCE 1886

the figure X in place of the 700-gallon per minute discharge.

Then we have

$$\frac{X \times 240}{1714} = 49$$

From the above we find X equals $49 \times 1714 \div 240$, or X equals 350 gallons per minute approximately.

Thus, you see, by increasing the discharge pressure by 100 per cent (doubling it), we reduce the capacity of the pump to one-half. This is on the assumption that the pump was using its full power when discharging the 700 gallons per minute at 120 pounds pump pressure.

So that when we change to low gear in a pump, we do so to enable the pump to deliver water at the higher pressure. If we attempted to have the pump deliver its rated capacity of 700 gallons per minute at double the pump pressure, the motor would not be of sufficient power to carry the load.

"True and False" Statements

To the Editor:

The following questions were given in a captain's examination. They are of the "true and false type." Please give the correct solutions.

1. Burning must accompany oxidation.

2. Radiated heat is easily dissipated in the air.

3. A pump cannot lift water unless there is air pressure on the water.

4. The velocity of a stream can be considered the same in a line everywhere but at the nozzle tip.

5. When tempered plate glass is broken it shatters into slivers.

6. The hotter the water, the more difficult it is to draft.

W. H. E.

Answer 1. True. With all oxidation there is evolution of heat, and there is combustion. Although this combustion may be too slow to show any visible indication thereof, nevertheless it is combustion.

Answer 2. False. If this were so, heat from the sun would not reach the earth. Of course, radiated heat may be absorbed by materials in the air, such as dust, etc., but the statement given does not infer that the path of radiated heat is so obstructed.

Answer 3. True. All the pump does is remove the pressure above the surface of the water, and the atmospheric pressure on the outside forces the water up into the pump.

Answer 4. True, if the line is of uniform diameter. If different sizes of hose are included in the same line, then the velocity would be higher in the smaller diameter hose. But if the line is of uniform diameter from end to end, then the velocity of the stream would be uniform throughout.

Answer 5. True.

Answer 6. True. The hotter the water, the less chance there is to create a partial vacuum above it, so that the differential between atmospheric pressure and the pressure above the heated liquid may be insufficient to raise water.

(*Continued on page* 883)

The AMERICAN CHIEF, JUNIOR

A newly developed, modern, quadruple auxiliary fire truck (pumper, tanker, hose cart and turret carrier) is now available to the nation's fire service, both rural and urban. Serves many of the functions of a larger pumping unit yet costs only about 1/3 as much.

The unit, with self-contained 225-gallon booster tank, 300 GPM, two-stage high pressure, front mounted centrifugal pump, Myers high pressure fog gun, 250 GPM, Handy Billy portable pump, plus two turret nozzles and other miscellaneous equipment and tools. Truly a small unit designed for big jobs!

For complete information on standard or custom units write:

C. F. KADAS CO.
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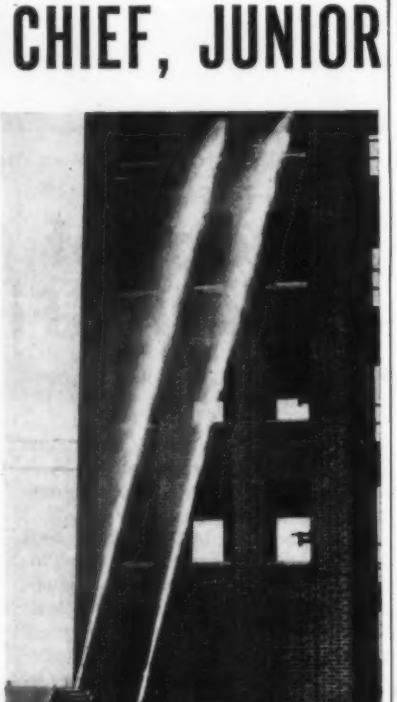

Persons in the News

Chief Sutton on the Job After Injuries

Fire Chief Millard H. Sutton of the District of Columbia Fire Department returned to active service August 15th after seven months in a hospital bed. His hospitalization was the result of injuries received at the Standard Tire & Battery Co. blast and fire in Washington, which struck him down with 40 other firemen. The 56-year-old Chief received 27 separate fractures in both legs, as well as other injuries.

The Chief spent the last six months in Casualty and George Washington University Hospitals, his legs in traction; recently he has been taking convalescent treatment at George Washington Hospital.

His injuries resulted in the first sick leave he had taken in his long career as a fireman.

Kelly Succeeds Walsh in Frisco

Frank P. Kelly, a veteran of 44 years with the San Francisco Fire Department, became the new Chief of the organization on August 21, succeeding Edward P. Walsh. The incumbent chief, who has been under treatment in a hospital, served notice of his desire to retire late in July.

The Fire Commission also announced

the temporary appointment of Carl Kruger, assistant chief in charge of the Mint Station, to succeed Kelly. The appointment is for 90 days pending the holding of a civil service examination.

Kelly, 65, entered the department in 1909 and won promotion through the ranks until he was named Fire Marshal in 1926. He was appointed chief of the bureau of fire prevention and investigation in 1936, "I am very happy to receive the appointment of chief," Kelly said. "I haven't too many years of service left and it's an honor to wind up my career as chief of the department."

Kruger is also a department veteran, with 33 years' service. He was appointed battalion chief in 1938 and assistant chief four years later.

In announcing the appointments at a commission meeting, Max Sobel, commission president, praised Chief Walsh as one of the department's greatest chiefs and said that the commission was grieved over his forced retirement because of illness.

Chief R. L. Woolard Honored

Chief R. L. Woolard, of Norfolk, Va., was recently honored by the citizens of that city as he neared the end of a period of thirty-five years of community service.

Chief R. L. Woolard

He was awarded the Civitan Club's Public Service Award during a banquet staged in his honor at the Norfolk Yacht and Country Club. The selection was unanimous on the first ballot taken by a five-man committee, set up to pick the award for top city employees. The presentation was made by John S. Alfriend, President of Norfolk's Chamber of Commerce and Norfolk's 1952 First Citizen.

AEC Plants Good Risks?

The frequency of accidents in atomic energy operations continued to decline during the first quarter of 1953 and fire experience also maintained its favorable trend, according to latest figures reported by the Atomic Energy Commission.

Two persons were killed in one fire during the first quarter of the year, AEC reported. A 1953 fire experience represents a projected fire loss of $0.0008 per $100 of property evaluation, well below the national average of about $0.04 per $100 in well-protected industrial properties, according to the commission.

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GIVES TRIPLE-GUARDED PROTECTION
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National fire-tests every batch of foam it produces and all its types of foam devices . . . checks their performance on actual flammable liquid fire, for full dependability in your plant.
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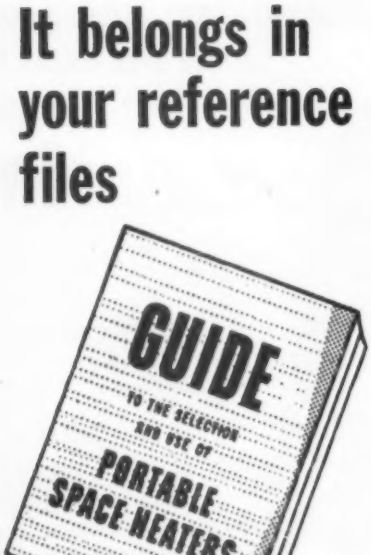
It belongs in your reference files



Here at last is the unbiased story on what's safe and what's not so safe in portable heaters. It gives you ALL the facts about ALL portable heaters. Not a technical manual, but an easy-to-read, amply illustrated 40 page booklet. Send for it, read it, keep it in your files.

Published in the interest of FIRE SAFETY by HERMAN NELSON portable air heaters

another product of AMERICAN AIR FILTER CO., Moline, Ill.

AMERICAN AIR FILTER CO.
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YES! Please send me by return mail my copy of your free "Guide to the Selection and Use of Portable Space Heaters".

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Short Cuts and Gadgets

SUGGESTS A TRAFFIC "FLYING SQUAD"

From that indefatigable Contributor, Chief John O'Hearn, Secretary-Treasurer, New England Association of Fire Chiefs, comes an item from "Observant Citizen" in the Sunday Boston Post of Feb. 24, 1946. Says Chief O'Hearn: "It speaks for itself and seems worth repeating to the whole Fire Service through FIRE ENGINEERING." All right, Chief, here is the item, just as it was written, for what good our readers may want to make of it:

"Thinking upon vehicles stalled in Newspaper Row traffic (a busy section of narrow-street Boston), the Observant Citizen wondered the other day about the three fire engines that stood stalled in the Row. They were on their way home, thank heaven. The first engine banged away dolefully and futilely on its bell, and occasionally tried bleating with its howler, but the traffic did not move until the light changed way down at State Street. Those fire fighters were delayed three minutes—if they weren't caught by the light again before they got by State.

"The regular traffic officers do wonders with Boston traffic considering how thinly they are spread, but here was a situation outside their scope. It seems to me it would be worth while for either the police or the fire department to organize a flying squad of traffic officers. When the alarms come in these men could be dropped by squad cars where they are needed to keep traffic flowing freely along or entirely cleared from the routes the engines will use going to or returning from the fires.

"There is no telling what the cost of a few minutes' delay of the fire apparatus may be in lives and dollars."

* * *

HERE'S AN IDEA THAT'S A CARD!

The following letter from reader E. S. Spinning, of Bernardsville Fire Company No. 1, Bernardsville, N. J., tells its own tale. Our volunteer friends ought to take to this and we thank Contributor Spinning.

"In the January issue of FIRE ENGINEERING, page 43, under the heading of a convenient notice form, appears a copy of a card used by the Story County, Iowa, Firemen's Association.

"We have been using cards for this purpose for a number of years, as per the attached. A punch was used for some time to indicate the time, date, occasion, etc., but this was abandoned in favor of a circle or check mark, the latter being found much more convenient.

"These cards are ordered in quantity, and as the local printer keeps this form set up here, there is no delay in renewing an order.

"If this appears worthwhile. use it" concludes Brother Spinning. And so we do! Note: Incidentally, these cards are regular government stamped issue.

* * *

PROTECTIVE FOG APPLICATOR COVER

A four-inch length of truck radiator hose makes an excellent protective cover for the fog head of a fog nozzle applicator.

If you haven't a hose with the exact I.D. (internal diameter), split the available section half way down and slide it along the applicator, forcing the open end over the head.

CHIEF SYDNEY R. DOBBS

* * *

IMPROMPTU FORCIBLE ENTRY

An anonymous contributor sends a clipping about how a frantic father used his motor car and a chain from a child's swing to yank the bars off a window that was blocking escape or rescue of two of his children. What appeals to this editor is the fact that you don't hear very much about the use of the old "pull-down chain and hook" which used to be standard equipment for ladder trucks.

One fire chief of our acquaintance has equipped all his ladder trucks with a strong wire cable (similar to the towing cables sold to auto users, only stronger), in one end of which is a steel hook and in the other end, an eye-splice.

Since so doing he has had numerous instances where the cables and hooks

SUNDAY MONDAY TUESDAY WEDNESDAY THURSDAY FRIDAY SATURDAY

JAN. FEB. MARCH APRIL MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

Bernardsville Fire Company, No. 1

BERNARDSVILLE, N. J., ...19

Dear Sir:—

You are requested to attend a meeting to be held in the Fire Headquarters, the character, date and hour of which is indicated on the margin.

Respectfully,

_____ Secretary.
Chief.

1 2 3 4 5 6 7 7:30 8 8:30 9 10 11 12 A.M. P.M.

ANNUAL | COMMITTEE | SPECIAL | UNIFORM | PARADE
REGULAR | SPECIAL | SERVICES | INSPECTION | DRILL

have come in handy in rescue work, overhaul, demolition and traffic control. Incidentally, although all his apparatus carry the regulation life line and other rope, this chief does not believe in attempting to use rope for a tough job that requires a steel cable.

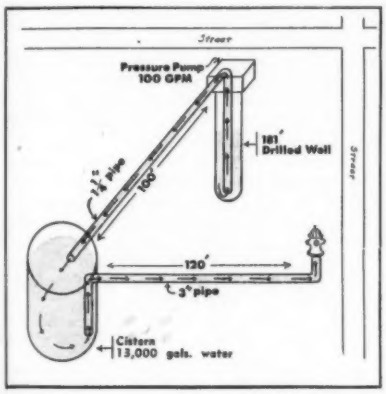
P.S. The item about the father's rescue of children came from Memphis, Tenn. Mr. and Mrs. Wilkerson returned from a brief drive to find their home on fire. Inside, alone, were their two children aged 3 and 4. All windows were guarded by iron bars. The doors were wreathed in flame.

Wilkerson drove his car to the rear of the house, he yanked apart a child's swing, hooked one of the steel chains to his car's bumper, the other to bars in the windows of his son's room. Then the car jerked away the bars. Wilkerson leaped through the broken window, snatched up the two terrified children and carried them to safety.

* * *

WELL WORTH WHILE

This idea is lifted from Iowa State College Bulletin "Fire Service Information" dated July, 1953.



The Moravia, Ia., Fire Department recently installed the hydrant layout shown in sketch herewith, with a hydrant attached to a 13,000-gallon cistern in the community. This makes use of an otherwise inaccessible supply of water.

The idea is well worth while because there are many small fire departments in the nation that have water supplies of this type but are unable to gain access to the wells or cisterns.

Moravia is planning to set one or two more hydrants attached to cisterns on its main street. The main from the cistern to hydrant is buried 4 feet underground. It should be kept in mind that in a setup of this type it should be possible to draft water horizontally at least 200 feet so long as the depth from the hydrant outlet and water level in the cistern does not exceed the maximum lift on the pump.

* * *

The Old Timer Says—

It's encouragin' to see the inauguration of mutual aid plans 'n programs throughout the country—and their integration into civil defense. But it's *dis*couragin' to see how most of 'em are missin' one of the fundamental needs to make mutual aid really work. I mean adapters, where there is no standardization of hose threads. And I mean adapters for *suction hose threads,* as well as for *the 2½-in. stuff.*

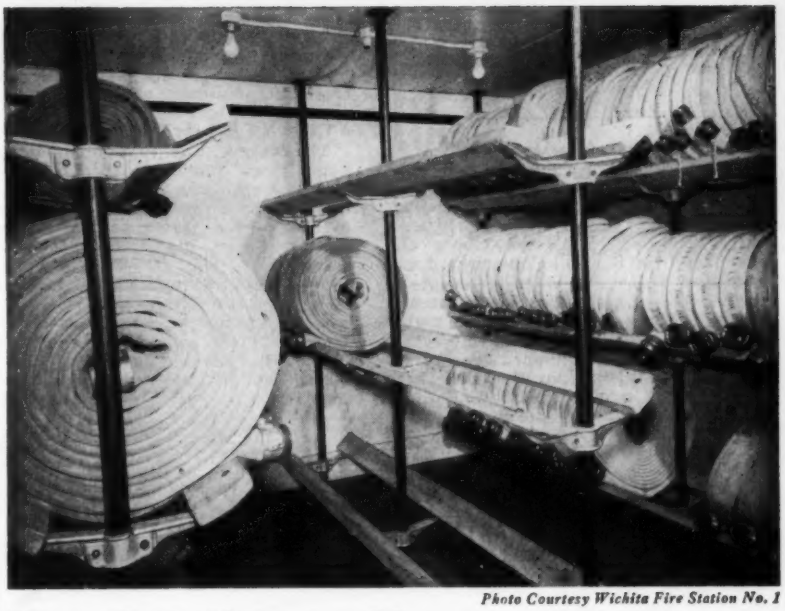
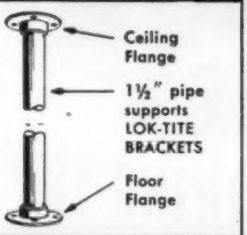


Photo Courtesy Wichita Fire Station No. 1

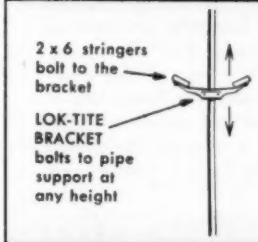
The Solution to Hose Storage Problems

FEATURES

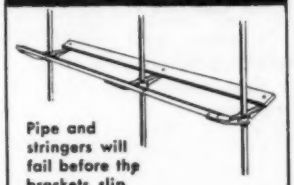
SIMPLE INSTALLATION



EASY ADJUSTMENT



BIG LOAD SUPPORT



Build Your Own Racks With Lok-Tite Brackets

MIGHTY few station houses have all the room they need for good housekeeping. Lok-Tite brackets help solve the hose storage problem by allowing ample ventilation and access in limited storage space.

Build your own racks with new or used materials. Design your own storage to take full advantage of the space available. Have ample room for fittings inspection and ventilation.

Lok-Tite brackets, light weight aluminum alloy, designed for strength and easy installation.

$3.65 F.O.B. Wichita

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157 NORTH WACO STREET — WICHITA, KANSAS

World Wide Fire News

By Roi B. Woolley

Mate and Cook Avert Tanker Disaster

Another oil tanker disaster was prevented August 3rd, when quick action by two of its crew members averted a serious blaze. The tanker, the 110,000-barrel Southern Sun, was taking on gasoline at the Sun Oil Company's dock at Marcus Hook, Pa., when fire erupted, evidently from a short circuit in a temporarily light circuit used for night work.

Six crew members jumped overboard, and were rescued from the Delaware River by other employes. The men were ordered overboard by the tanker's chief mate John Hand, who then, with the aid of Ernest Stichter, manned hose lines and checked the fire. They got credit for preventing a serious situation.

* * *

A-Tests Hurt Nobody But Did Burn Horses

The Atomic Energy Commission announced on July 30 that radioactivity from the extensive atomic test series at Nevada last spring resulted in no hazard to health or safety of populated areas.

Some horses grazing near the test area suffered skin burns from a "fall-out"—radioactive particles falling on their pastures—but, said AEC in a report to Congress: "There is no evidence that the general health of the animals was affected by radiation."

The Commission said that during the tests, a few people in Nevada and surrounding states reported various symptoms, such as nausea, headache, rash and the like which they feared were caused by radiation. Investigations by both the AEC and the U.S. Public Health Service, however, failed to show that radiation was the cause of these ills, the report said, adding: "An example was the case of a child who suffered a rash which was found to be German measles."

* * *

Toll Turnpike Pack Sought

The Board of Fire Commissioners of Elizabeth, N. J., moved on July 3, last, to solve its differences with the New Jersey Turnpike Authority when it asked in a letter what the authority had decided to do about fire protection on the toll road.

The Board had recently turned down an offer of $50 for each alarm answered on the Elizabeth stretch of the pike. As a result, the authority's counsel was to have worked out an agreement with the city law department.

Fire department officials have been instructed by the board to answer alarms on the toll road at their discretion. Full protection, they said, cannot be provided because insurance coverage would not apply in case of damage to equipment or injury to personnel.

It might be pointed out, also, that the problem of reporting fires and accidents quickly, and getting help on the scene on this, and other toll roads still has a lot of kinks to be ironed out.

* * *

Hot Off the News Ticker

On July 24, last, 17 persons were dead and there missing in a $1½ million blaze set by arsonists in Cebu, P. I. Police rounded up 12 Filipinos and Chinese for questioning next day who were suspected of starting the fire. . . . Five Japanese were killed and six injured at a chemical plant explosion Aug. 1, in Soka, Japan.. . . . Fifty bluejackets from a visiting U.S. destroyer put out a $200,000 fire in Cienfuegos, Cuba, on July 25, after lack of water had frustrated local firefighting efforts. One American, overcome by fumes, was hospitalized in serious condition. . . . In another Cuban incident, the Court of Instruction in the Town of Cardenas, on the north coast of Matanzas Province, ordered an investigation following a fire which late July 31 destroyed two warehouses containing about 200,000 bags of raw sugar, and six railway cars loaded with sugar. Damage was estimated at $1 million. Authorities suspect sabotage. The warehouses were operated by the Maritime Construction Co. . . . Out in Regina, Canada, firemen are a big help. The city Brothers even aid housewives by bringing in their washing for 'em. So far this year they have received 49 calls to straighten out washing that was snarled and twisted on clotheslines by high winds. . . . In June, at least 25 persons were burned to death in wind-driven fires that swept through 9 villages in northern Egypt and destroyed 668 huts. Over 400 huts were burned in the village of Balkeen alone, killing 18 persons. The huts caught fire when sparks hit thatched roofs. . . . Coastguardsmen and the crew of the Swedish freighter Stegeholm fought a stubborn fire in one hold of that ship in the Gulf of Mexico. . . . Firemen battled all day, June 7, last, before killing a fire raging in the 8,842-ton Danish passenger-freighter Selandia. Ship was en route from Thailand to

New optical principal of light projection plus its beautiful streamlined chrome and plastic design makes the NEW Trippe 360° Revolving Warning Light something to be seen. The entire top of this most modern of all lights is ruby red #2 Tenite plastic. The front lens is also ruby red Type 2 Plexiglas. The light source is a super-powerful 100 c.p. bulb around which a motor drives a silvered parabolic mirror 90 times a minute. Like a light-house the flash is terrific and can be seen in EVERY direction for blocks.

THE MOST POWERFUL LIGHT OF ITS TYPE

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CHICAGO 6, ILL.

Copenhagen with a cargo of rubber and copra. . . . When the Barn Elm reservoir, London, was cleaned out awhile ago, they found three tons of fish and 11 unexploded bombs dropped by the Germans in World War II. . . . Tokyo schools are potential firetraps, the military government education officer warned a few years ago. The officer said "a typical fire drill consists of children jumping out the windows, shrieking in panic." . . . A mother and two sons were hurt in Buffalo, N. Y., when an artillery shell, kept in a box in the kitchen, exploded. Blast occurred when one of the boys tossed a piece of metal into the box. . . . Three British seamen pleaded guilty in criminal court in Montreal last June to having set fire to their ship, the Gibou on May 29. . . . In Helsinki, Finland, a 63-year-old landlady found a new way to evict tenants who fall behind in their rent. She used dynamite, exploding six charges under a house. No one was injured. . . . This item was headed "Firemen Get the Bird": The Havant, England, Fire Brigade's siren failed to sound when firemen were called to a fire. Reason: a bird had made its nest in the siren mechanism (Thanks Francis Burke). . . . In Vancouver, B. C., ten persons fled when fire swept through their home—but not Fido. After the embers cooled, firemen found the black-and-white puppy sitting in the only cool spot in the house,—a water-filled sink. (Thanks J. Jebens). . . . A fierce fire swept through eight acres of cane and plank houses in Singapore, July 16, razing the homes of 4,000 persons. A piece of glowing charcoal falling from a grate in a Chinese hut started the fire. . . . Late News: The Danish tanker Fenheim blew up in the harbor of Beira, Mozambique, June 28, last, while unloading gasoline, killing 30 natives and injuring 50 other persons, including several Europeans. Gasoline on the water caught fire and spread to the Fenheim and four other ships. . . . On July 5, last, Rio de Janeiro's largest department store, Exposicao, was totally destroyed by fire with damage estimated at more than 100 million cruzeiros ($5 million). . . . Four Chinese workmen burned to death in a fire which swept a freight boat in Hong Kong harbor July 5. Fire department laid it to spontaneous "combustion."

* * *

Items About Atoms

ATOM CANNON BLAST INJURES WOMAN—A conventional shell from the powerful 280 millimeter cannon exploded about 120 yards outside of the Fort Sill military reservation in June, injuring one woman with shell fragments. Window breakage was reported in about a dozen homes in the area. No fires were started, however.

The woman was injured while lying in bed. The Army public information office said an incorrect charge had been fired, giving the shell much greater range. The shell made a crater about 8 ft. in diameter by 3 feet deep.

This is the cannon used to fire atomic shells.

* * *

NAVY PLANES TO DROP "SMALL" ATOM BOMBS—It is disclosed that a "substantial number" of ships would be armed with guided missiles in the next year and that the Navy was buying planes capable of dropping "small atomic bombs."

Rear Admiral T. S. Combs, Chief of

A new PACIFIC PUMPER the GA-8

Lightweight, air cooled, 4-cycle ...with or without electric starter

This new lightweight GA-8 is especially adaptable to tanker use . . . or can be dismounted and used as a portable unit. The special sled or skid type mounting permits easy handling in rough terrain. The unit can be readily carried if desired.

The engine and pump are standard Pacific Units and have been fully tested and approved.

DIMENSIONS

Length	28¾ inches
Width	19¼ inches
Height	24¼ inches

NET WEIGHT

GA-8-S (with starter)	140 lbs.
GA-8 (without starter)	115 lbs.

PERFORMANCE

Pressure	G.P.M.
50	26
100	24
150	22
200	21
250	20
300	16

Normal operation is 20 G.P.M. at 250 lbs. pressure.

PACIFIC "Pacolized" linen forestry Hose

is an "old friend" to foresters. Its reliability is known wherever there is need for portable or emergency water supply equipment . . . wherever there is a PACIFIC PUMPER.

"Pacolized" Hose is permanently mildew proof and rot-resistant; made from "line" flax fibers, it is the most flexible hose of its type, lightweight and easy to carry.

PACIFIC PUMPERS and accessories offer a full line of perfected equipment for portability and high performance.

Write for information on the new "GA-8" and other PACIFIC PUMPERS, hose and accessories.

PACIFIC MARINE SUPPLY CO.
FIRE EQUIPMENT DIVISION
SEATTLE 1, WASHINGTON

EMERGENCY CARS

By Sharpsville

THESE SHARPSVILLE Emergency Cars are gaining popularity because of their versatility and maneuverability. They become real companion pieces to your fire-fighting equipment. Many municipalities depend upon them for rescue and emergency work, answering accident calls, making ambulance runs. When so equipped they may be used, also, for handling many fires. You, too, will find that it becomes your busiest piece of equipment.

Through long years of experience in this type of body work, Sharpsville can build just what your department requires. It will be quality construction at surprisingly reasonable cost. If desired, your Emergency Car can be furnished with pump and tank, fog and foam system, and other equipment. Consult with Sharpsville on what you need. Write for complete information.

●

SHARPSVILLE
STEEL FABRICATORS, Inc.
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Established 1860
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ALSO BUILDERS OF STORAGE TANKS, SERVICE, CRASH AND LADDER TRUCKS, VOLUME AND HIGH PRESSURE PUMPERS.

the Navy's Bureau of Aeronautics, and Vice Admiral R. A. Oftsie, Deputy Chief of Naval Operations, urged a Senate Appropriations Committee to approve funds for guided missiles. Admiral Oftsie testified that "small atomic weapons have created unlimited possibilities for naval aviation" because there were many targets against which the "small bomb is the preferable weapon."

Nothing was disclosed as to whether or not Russia has the small bomb, or has experimented with guided missiles fired from naval ships.

Wartime Fire Fighting

(*Continued from page 779*)

would then arrive under orders from headquarters they had to do the same as the companies already on hand had done—push on to the nearest danger spot. Thus headquarters gradually lost touch with the forces in action. Uncertainty resulted. The attempts to regain full control of all forces cost serious delays and hampered the men at the fire front.

The situation improved as soon as commanders were appointed to take charge in certain areas and coordinate all forces in accordance with the situation he had personally sized up. But often the commander could not be located without a loss of time and the units were forced to work in accordance with their own judgment when they had found the designated area. Usually the forces would gravitate to suitable sources of water and good open streets, and did not penetrate freely into such areas where water supplies were scarce and/or the streets were blocked. It helped a little to organize the mutual aid forces in such a way that certain fire departments of neighboring municipalities formed convoys under specially trained leaders, such as it is the use at this date in American civil defense.

It became necessary to reorganize these convoys down to the smallest unit to adapt them to war conditions, which proved to be radically different from those of peacetime. The usefulness of the new organization under peacetime circumstances was not proven. The interminable, arduous work of fire service, following the continual aerial attacks, left hardly any time to train the men in accordance with the new facts and findings of the experienced professionals. To obtain new equipment which incorporated the latest designs to meet the changed conditions was nearly impossible. Last, but not least, even the highest placed brass hats responsible of firefighting often failed to catch on and understand the real difference between peace- and wartime fire fighting.

In peacetime the fire fighting units work side by side, in front of the fire. The fire is surrounded and the units keep in touch with each other. The forces deploy according to regulation and the activity of each individual is predetermined. Training guarantees that everything will run smoothly and automatically once the leader has indicated the place of action. The commander is personally on the scene when he gives his orders. He is in a position to accomplish much with only brief commands. Simultaneous fires in peacetime have no relation to each other. They are fought individually.

In wartime the multiple commander faces an "area of fires." This means a

section of the city with innumerable fires, one by the other. All of them have to be attacked simultaneously. There is neither time to determine their number nor their exact location. The multiple commander must enter into and penetrate the area of fires with his convoy. Coming in touch with the fire, the men gradually get a true picture of the situation. The convoy must be so flexible that not only can it attack at any and all places in the area but can also respond to quick changes in the situation. The slowness with which the fire brigade in action adapts itself to a sudden change of the situation is well known. During war conditions the various fires cannot be dealt with individually. The activities of the numerous units must be so coordinated that they result to a unified effort. Shortcomings anywhere may lead to a joining of separate fires to form a fire storm.

It must be remembered that after aerial attacks the municipal water supply may be out of action. Where such is the case, water for fire fighting must be taken from distant inexhaustable sources and distributed to the units all over the area. The friction losses of the hose lines require the use of boosters or relays. The distances between the boosters have to be determined. This calculation becomes extremely complicated for such a network of hoselines. There is usually no time for calculations. Last but not least, it is necessary in case of such immense tasks to utilize all available forces: Manpower—hoses—machinery one hundred per cent!

Therefore a special organization is required. Equipment and training must be specialized. The customary peacetime fire fighting services cannot hope to cope successfully with war conditions without great changes. After a few short orders, the various units must be able to enter deep into the fire area, laying their own water supply as they go. As soon as the forces are deployed, this freshly laid network of hose with the great number of boosters required must give trouble-free service at a great number of widely dispersed locations. The physical laws of hydraulics must be conformed with immediately and without calculation.

The basis for organizing these special units in Germany was their method of their deployment. A basic plan had to be created which permitted the individual units to be placed on the ground as a prefabricated house is built. It must be possible to place the units side by side or one behind the other in any required combination. A German unit was composed of one hose truck, 2 pumpers of 700 g.p.m. each and one truck carrying two portable pumpers of 200 g.p.m. each. The sketch herewith illustrates four different forms of deployment. A close examination will show that these are made from one basic form and developed to a different distance each time.

Sketch 1 shows long distance water supply. Sketches 2 to 4 show the increase of power in the fire-front with the reduction of the distance of the source of water. This form guarantees that with normal pump pressure the water flow and pressure at the nozzles is uniform in all cases and correspond to the demands of fire fighting. The sketch shows the distances in feet. The men learn to figure in hose-lengths. But even for counting the hose-length there is no

THE BOOTS THAT HELP FIGHT FIRES

—and stand up to this tough job *one third longer* than ordinary boots because they're made of an extremely tough rubber compound.

Designed for firemen exclusively with many special features: Thick-cleated, white, wrap-around outsole for maximum foot protection and visibility; built-in maplewood shank for comfort on ladders; stay-open reinforced collar.

CHECK OFF THESE MANY REASONS WHY U. S. FIREFIGHTER BOOTS GIVE YOU UNBEATABLE VALUE AND PROTECTION

- Thick-cleated outsoles for perfect grip.
- Built-in sturdy maplewood shank for ladder climbing.
- High skirt that doubles down but will not drag.
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- Wool felt lining with air-cushion insole.
- Smooth, snag-resistant 8 oz. duck construction.
- Firmly anchored, large pull-on loops.

U. S. Royal Firefighter Coats

100% waterproof coats take a drenching, yet keep a man dry. Sturdy black rubber with warm, napped maroon-colored linings. Roomy, 2-piece body—raglan shoulders for action; fly-front in instant snap-and-dee fasteners; large patch pockets. All seams are cemented, outside gum-strapped; entire coat is then vulcanized.

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time now. Therefore the hose beds of the fire trucks should have such dimensions that they always contain the exact length either required from the booster to the siamese or from the siamese to the next booster. Upon entering the fire area, the convoy starts laying hose from the source of water. Whenever a hose bed is empty, either a booster or a siamese has to be placed in the line. It is only necessary to indicate whether the units are to advance either one behind the other or beside each other. The commander is free to concentrate on his tasks. His orders are short and simple; the network develops automatically and without calculation. Advancing, the convoy has to clear away small piles of debris. Greater obstacles have to be avoided by going to side streets. This is regulated by subordinates, who have scouts on motorcycles at their disposal.

The illustrations are based on German equipment. Working with German hose, nozzles and pumps, the water flow and pressure at the nozzles are accommodated to the needs of fire fighting. This also allows for a raise of 30 ft. elevation from booster to booster.

It is possible to hook up any number of such units behind each other and to pump the water over several miles. When extremely large distances intervene between the source of water and the fire, it is better to use lightweight piping for the first part of the line. In this case the special formation is used from the end of the lightweight line. The deployment of the standard unit serves as a pattern for all other fire fighting forces.

It should not prove difficult to develop such a foolproof "standard unit" for American equipment. Unless this is done very soon, i.e. before the beginning of the next war, the multiple commander himself will stand more or less helpless in the face of a fire area caused by enemy aerial attack, even if he has at his disposal a much greater and more perfect system of communications than we had in the last war. The author realizes this hopeless situation from practical experience in fighting fires in German cities.

Only the multiple commander who is in a position to deploy his forces despite the lack of detailed information on the fire situation and who can take action immediately can face the outbreak of war with good conscience. Therefore: "Carpe diem"—Seize the present opportunity!

The New Carpenter
WIG-WAG REDHEAD
FOR FIRE, POLICE AND EMERGENCY CARS AND TRUCKS, AIRPLANES . . .
The oscillating beam of this powerful, flashing WARNING LIGHT
CLEARS THE WAY . . . and fast!
Range of 1000-1500 feet and a sweep from side to side
FAR, FAR AHEAD
WARNS CARS APPROACHING AROUND INTERSECTIONS
TYPE WW6 (Illustrated). Flashing and Oscillating—6" diameter. Also Oscillating only, 6" diameter.
TYPE WW8. Flashing and Oscillating, 8" diameter. Oscillating only, 8" diam.
TYPE 166. Same as above. Flashing but without Oscillator. 3800 foot range. 6" diameter.
TYPE 168. Same as 166. 8" diameter and 4500 foot range.
TYPE F'N'A (Fore'N'Aft). Like 166 except drum shaped with two reflectors and two colored lenses, one facing forward and one toward rear, flashing. 6 volt units will be shipped unless 12 volt specified. Specify other color if red is not wanted.
Type F-5 High Power Portalite
Finest Dry-Battery Light made. Clamps on 7½ volt dry battery pack. Moderate worklight for 24 consecutive hours or a powerful mile-range searchlight for 8-10 hours (much longer if used intermittently). Also available with rugged cast aluminum case for battery in Duro-Satin finish (Type BF-5).
Type RA-1 Red 360° Flashing Light For Cars
Cylindrical Fresnel Lens. Certified by E.T.L. Approved by Nat'l Highway Comm. for work and repair cars and trucks, Fire and Police cars, public utility vehicles. 3¼ in. lens with quality flasher. 4½ in. lens with built-in flasher.
Type RAD Dome Light
Similar to above except 5" Bee-hive lens. (All above lights — with or without flasher)
CARPENTER MANUFACTURING COMPANY
200 MASTER-LIGHT BLDG. BOSTON—45—SOMERVILLE, MASS.
"Master-Light Makers for 34 Years"

"Wet" Water

(*Continued from page 776*)

ing surface. Oxygen was being supplied by the material itself, in the process of burning, and all forms of extinguishing agents such as water, CO_2, foam, dry powder, etc., were having no effect whatsoever on the material from an extinguishing standpoint. Wet water was applied and this penetrated this shell-like coating which covered the burning material and effected the extinguishment. We feel that it is good for baled material too, such as cotton, paper and rags.

Yes, I feel that wetting agents have their place in the fire service; however, some common sense must be used in connection with their use. Of course, in the fire service, we are a bit slow to accept new processes and equipment, for some odd reason or other, it seems.

There are some disadvantages, too, in connection with wet water; for example, on some of the packing glands on the pumps, and the loosening of scale inside the booster tanks. And don't forget this one: Be careful of using wet water in connection with your salvage covers, for it may go right through them and of course give you some water damage trouble.

J. C. Wilkerson

Chief, Augusta Fire Department, Augusta, Ga.

We use wetting agents in booster tanks and pump can extinguishers in our department. Consider it excellent for cotton fires, sawdust and wood shavings. We have used wetting agent on such fires and believe that this extinguishing agent has established itself in the fire service. However, the price of wetting agents limits their use for the average fire department.

We have encountered no troubles as a result of the use of wetting agents.

W. B. Salyers

Chief, Covington Fire Department, Covington, Ky.

We have never used wetting agents in our city, except for demonstration trials or similar purpose; therefore I am unable to advise to any extent on their actual usefulness. As for offering any

recommendations, I might add that it appears that the cost of wetting agents is very high; yet the demonstrations that I have observed leads me to believe that it would be very practical in cities which have textile mills and other combustible materials which can only be extinguished by soaking and wetting down.

General Motors Fire

(*Continued from Page* 791)

only 10 or 15 minutes from the fire. It was 4:32 P.M. when Detroit firemen got clearance and were on their way.

In an effort to secure more water, the Wayne Fire Department went to the rear of the plant and took suction from a drainage ditch.

Crowds Hamper Firemen

The mounting cloud of smoke, movement of apparatus, and the broadcasting of reports of the fire, coming at a time when many workers were going to or from work, created vast traffic congestion which required all available regular, reserve and auxiliary police to control it. Guards were quickly thrown around the plant and spectators kept at a distance, but the jammed thoroughfares interfered with movements of emergency vehicles, notwithstanding the road blocks thrown up by police.

Emergency medical and civil defense forces, as well as Red Cross units, were quickly on the job. First aid stations were set up around the vast plant and the injured were treated on the grounds. Ambulances removed the more serious cases to hospitals.

Plant protection men and other employes carried out records, electrical recording and other equipment, which was moved to safety on fork-lifts. Over 300 firemen and volunteers and civil defense workers manned the many hose lines. As darkness fell, 24 civil defense floodlight units were secured from Detroit to light up the scene. After the plant walls and roof collapsed, plant security officers permitted no one but firemen to enter parts of the structure.

The fire blazed up intermittently the following day, as FBI, insurance, police, fire and other investigators probed into the cause and searched for possible further casualties.

Hazardous Materials

(*Continued from page* 789)

create too great a problem. A small local dealer starting out on a small capital and hiring anyone that can drive a truck constitutes a problem that can be coped with only by rigid inspections and education in the dangers involved in handling flammable liquids.

Arthur J. Massett
Deputy Chief, In Charge
Division of Combustibles
New York Fire Department

1. Fire Department specifications in this city regulate the construction, capacity, and fire protection for the following trucks:

(a) Airport Tenders, used for the transportation of gasoline at airports within New York City.

(b) Tank and Platform trucks, used

REDUCE FIRE LOSSES

Damage from water and smoke is cut down when SHUREDRY Green-Bak Salvage Covers are on the job. Only the finest quality, treated cotton duck, which is pressure impregnated by the exclusive Fulton dry-treatment, is used in SHUREDRY Covers. All seams are waterproof, and SHUREDRY Covers are light—pliable and easy-to-handle. For top dependability — specify SHUREDRY when ordering salvage covers from your Fire Equipment Dealers.

Shuredry Green-Bak Covers will pass the test specified by the National Board of Fire Underwriters. They also carry the approved symbol of the Associated Factory Mutual Fire Insurance Companies.

VISIT WITH G. E. KOHN

Our representative G. E. Kohn will be delighted to see you at the I.A.F.C. Convention. He will be at Booth 60 ready to supply you with Salvage Cover Information. Call on him if he can be of service to you.

Fulton
BAG & COTTON MILLS
ATLANTA • ST. LOUIS • NEW ORLEANS • DALLAS • LOS ANGELES
DENVER • MINNEAPOLIS • KANSAS CITY, KANS. • NEW YORK
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CAIRNS FIRE HELMETS

AMERICA'S "REGULATION" STANDARDS

The "NEW YORKER"

No. 5A

The "original" leather helmet, introduced by CAIRNS in the early 1800's, and steadily improved through the years since. Its specially-tanned top-grain steer hide and superior design make the "NEW YORKER" the safest, toughest, strongest, most durable helmet on the market.

The "SENATOR"

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Pressed from one piece of rolled aluminum, with corrugated 4-comb crown and reinforced beaded brim, the "SENATOR" meets the preferences of those seeking a light-weight helmet that is comfortable, safe, strong and durable.

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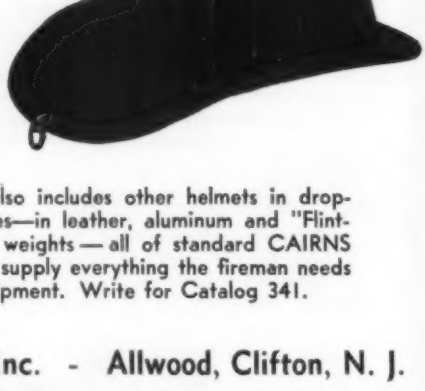
No. 900

Here's the latest of the modern "plastic" helmets—a replica of the "NEW YORKER" in style, but molded in CAIRNS "Flint-Flex" — hard but not brittle, tough and flexible while still keeping its shape, light in weight, non-conducting, chemical-resistant.



The CAIRNS line also includes other helmets in drop-brim and other styles—in leather, aluminum and "Flint-Flex," and in other weights — all of standard CAIRNS QUALITY. We can supply everything the fireman needs for his personal equipment. Write for Catalog 341.

CAIRNS & BRO., Inc. - Allwood, Clifton, N. J.

SINCE 1836

for the transportation of gasoline and fuel oil throughout New York City.

(c) Explosive trucks, used for the transportation of explosives throuhgout New York City.

2. Restrictions under Section C19-31.1 of the Administrative Code limit the movement of explosive trucks within New York City.

There are no restrictions on the movement of Tank and Platform trucks throughout the city.

Airport Tender Trucks are restricted to use within confines of airfield.

3. There have been no major fires or catastrophes involving such trucks in New York City. However, an occurrence involving a fuel oil truck on ramp leading off main roadway of Queensboro Bridge could have created a most hazardous condition. This truck, traveling west on the main roadway of the Queensboro Bridge, had a fire involving the brake-lining. The fire communicated to grease and dirt on under portion of tank and truck frame, and resulted in the complete failure of braking system of truck. This failure occurred just as the truck reached the ramp leading off main roadway to East 60th Street. The truck, out of control, struck two other vehicles and ramp side-wall construction. Fortunately, there was no rupture in the tank construction, and fire was quickly controlled.

4. In New York City, vehicular and pedestrian congestion increases the hazard of accidents and resultant fires involving tank trucks. To reduce this, increased restrictions on the time of day for tank truck deliveries should be considered, so that the number of tank trucks on streets during peak vehicular congestion should be limited.

Training Facilities

(*Continued from page* 798)

(with which the School is well equipped).

There are pits in which oil fires are extinguished, using different techniques and equipment. There is also a set-up used to demonstrate the hazard of uncontrolled propane vapor. Fires in street manholes are fought under actual conditions (the street manhole containing three 75 kva. transformers and covered with steel grating). To demonstrate the hazard of coal dust explosions, a cloud of pulverized coal is created inside the smoke house, which drifts to an open flame and ignites.

Illustrating that water-fog can be safely used on high voltage electrical apparatus, a steel grating is suspended from a horizontal wire at about 8 ft. above ground. Men hold bronze 2½ in. high velocity fog nozzles, and other types, in their bare hands, while standing on wet grounds only 6 ft. away from the target. A spark gap flashes over at 27,000 volts to ground to make the grating really "hot."

Other facilities in the Fire School include a standard mixing chamber, such as are mounted on top of oil storage tanks; a model fire alarm signal system; masks; ladders, and other fire and rescue equipment, all of which serve in the training-by-doing courses.

During the winter months, occasional classes are held in the auditorium of the Company's general offices. At that time a demonstration lecture on the Chemistry of Fire is given to supervisors, using small laboratory sized experimental apparatus.

It is of note that this School has at its command two new specially designed and built fire pumpers, used for protection at the Astoria and Hunts Point plants. These cost, exclusive of equipment and fittings, slightly less than $7,000 each.

Recently the Coast Guard sent the first group of 60 of 1500 of its men who will take the courses on fire protection, to this School for the "full treatment."

Financing

(*Continued from page* 801)

In between these extremes are the other methods employed to finance volunteer organizations, their meeting rooms, fire stations, training grounds, public enterprises, and other activities. Yes, to many who do not know the heritage and history of the volunteers, the stories behind their growth, and the work they do, it may appear that sometimes the volunteers are asking for finances for non-essentials. To the skeptics, we might quote from Henry Morton Robinson's interesting article in *Esquire*, "Bucket Brigade, Current Style." "The volunteer fire departments of the United States constitute a modernized defense against the ever-present fire peril, but perhaps more important yet, they keep alive the spirit of voluntary and independent association, traditionally dear to the American heart. This spirit, so often threatened with extinction, flourishes vigorously today in our volunteer fire companies—the last, in many respects of the 'free assemblies' guaranteed by our Bill of Rights. These miniature and self-supporting democracies, composed of modern minute men, are housed under their own roof and banded together on an American principle as old as the town meeting and as indigenous as corn. When the last volunteer company disappears, then, and then only, can we really begin to fear for the institution of self-government."

Some Plans and Programs to Raise Money

If there is a stunt, scheme, idea or dream to increase the treasury of the volunteer fire department that has not been tried by some company somewhere, this author does not know of it. Lack of space prevents recountal of all these methods, from the unusual enterprise operated by a California volunteer fire department (a weekly dance in a half-acre outdoor dance hall owned by the company, which has financed a modern $500,000 fire department) to the financial operations of a small but exclusive volunteer outfit tucked away in rural Pennsylvania which was storied in the *Saturday Evening Post*, no less. This little company raises practically its entire budget at an annual carnival in July. There are concerns which put on firemen's carnivals for a percentage of the "take," but these volunteers have a low opinion of that arrangement. Instead they put on 75% of their own show and are careful in picking the rest. It lasts a week and up to a few years ago, cleared $10,000. Bingo formerly took in about $6,000 and paid out $5,000 in prizes. The doll wheel grossed $2,200; $2,500 worth of hot dogs and pop were sold; and one year $437.81 worth of popcorn. Rides were provided by concessionaires, who turned over 25% of their gross. There are no money

Here it is! the modern hose construction...

Quaker

DELAWARE BRAND FIRE HOSE

Twin jackets of finest quality cotton warp thread . . . with the new, stronger "dacron" synthetic fibre used as filler! That's what gives the new Delaware Fire Hose its lightness and flexibility . . . yet the strength to withstand 50% greater pressure! New high resistance to heat, chemicals, water absorption, mildew and abrasion. All this plus flexibility that permits storing more hose than ever before in your truck bed. Investigate the new 600-pound test Delaware Fire Hose. It outmodes conventional hose . . . in performance, wear and economy!
Write for name of nearest distributor
See us in Toronto at I. A. F. C., September 14–18.

Water and Chemical Fire Hose for Every Municipal and Industrial Need.

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DIVISION OF H. K. PORTER COMPANY, INC.
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wheels, no liquor and no questionable side shows. The community regards the affair as good family fun and turns out in force. This, and a single annual letter of solicitation for funds for a specific need, have given this unit one of the finest equipped fire departments, with a comfortably financed treasury.

Here briefly are some of the methods used by other volunteers:

A personal canvas of taxpayers and business people raised $19,000 for a Pennsylvania department.

An annual rummage sale finances an Iowa organization—and nicely, too.

A Maryland outfit is the envy of other departments with its annual "turkey shoots."

Most popular, of course, of the big money raisers, are the carnivals, with the circus also a producer, under the right conditions. A number of theatrical concerns stage ice skating and other shows of varying caliber, some of which have produced heavily for energetic fire departments both paid and volunteer. Usually the department gets 50 cents on each one-dollar ticket sold. The show hires the theatre or armory and pays other expenses, including certain advertising.

Several small town departments hold monthly smokers with varied entertainment. Some sell season tickets; others stage raffles in connection with these smokers.

Many progressive companies raise funds within the companies themselves, by means of prize-drawing contests, raffles, numbers games, etc. Frequently this income is kept in a separate fund for special purposes, such as sponsorship of Boy Scout Troops, etc.

Contests, tournaments, water battles, musters, parades and the like, all are made to pay dividends of one kind of another.

When well conducted and operated, a souvenir yearbook issued on a special anniversary, or commemorating some special event may produce revenue. At the same time, its publication may be fraught with pitfalls. Only a month ago a large state association, which for years had engaged the services of an outside promoter to solicit its advertising for its year-book, voted in the future to handle all details of its book within its own family. Solicitation of advertising by outsiders, unless scrupulously controlled, can have serious repercussions. Where local souvenir programs and other publications are prepared, the propostion should not run counter to the local board of trade or other "better business" regulations. Frequently, the first thought for raising money to pop into the minds of the average volunteer is "let's get out a book or magazine, and sell advertising." It might be added that the record of failures in such projects far outweigh the successes.

One prosperous New York fire department limits its fund raising (as a department) to an annual theatrical show, staged by a professional cast in the high school auditorium. Originally the firemen were their own actors but changed to professionals with better results. As part of the financial plan, an imposing program is published each year, the advertising revenue being distributed among the five companies of the department, according to the individual ticket sales percentages by companies.

In many small departments money is raised through "weekly socials," "get-togethers" and other community "parties." Here, as in other fund raising curricula, the ladies' auxiliaries prove their worth as producers. There is no end to the kind and number of revenue producing social events undertaken by the volunteers. A periodic dance is one of the best producers, providing the location, environment, music and other details measure up. Weekly bridge parties is another widely accepted modest treasury builder.

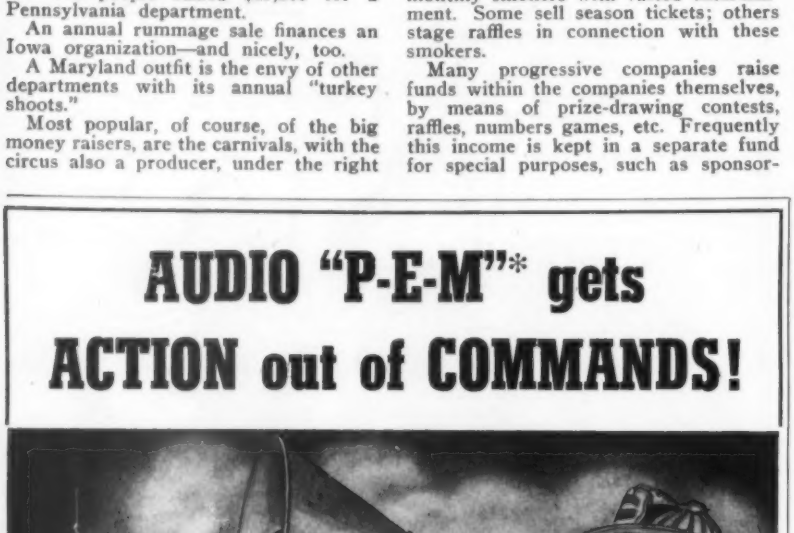
Special donations are sometimes solicited, such as when a fireman may be injured or an important person dies. It is found advisable not to make such solicitations until and unless a special occasion warrants it.

A number of volunteer fire departments have a small but steady income from periodic waste paper and metal collections. The fire station becomes a repository for all sorts of waste that can be converted into cash.

The "Fire Truck Fund," is the name of the fund-raising program of many departments to collect money for new apparatus. In addition to solicitation of public subscriptions, collection bottles, cans, or jars are placed with local merchants with suitable placards telling what the coins and folding money are wanted for. Names of subscribers are published by some organizations.

Another and widely adopted plan, is to sell shares of stock in a fire protection district or other enterprise. This procedure is usually followed in building rural fire protection. Shares (certificates for which are formally issued upon payment), may cost from $25 to $100. Farmers are given fire protection for

AUDIO "P-E-M"* gets ACTION out of COMMANDS!



*** "P-E-M"—means Audio Portable Electric Megaphone which amplifies the human voice 2500 times!**

Each year lives are lost because the people failed to hear commands. Unaided the human voice is too weak to rise above the din and turmoil of a disaster or fire. But with Audio Portable Electric Megaphone, the only High Power Megaphone, the voice is amplified 2500 times! Commands are transmitted with clarity, obeyed with precision and LIVES ARE SAVED!

Audio Portable Electric Megaphones enable the Fire Chief to direct men at fires, even in smoke filled rooms, guide rescue workers, control riots, strikes; search for lost persons and handle traffic jams—not only directing their activities more efficiently and with ease, but giving them all manner of instant warnings of grave dangers which otherwise cannot be heard in time to get people to safety.

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an indicated period of time for payment, and those who do not pay but who may require the services of the department, may be forced to pay the subscription price—or even more when they call for the services of the department.

Securing the sponsorship of local service or other organizations is often successful in procuring funds for special equipment, such as masks, lights, etc.

Certificates of Purchase are issued to cash subscribers by a number of Iowa volunteer departments.

Aid of the local newspapers and radio broadcast stations is essential in the promotion of any successful fund raising drive. Many county and small town weekly newspapers have been instrumental in the organizing and financing of local fire departments. Many of them have spearheaded fund raising campaigns.

A Maryland department staged an auto and motorcycle "Daredevil Show" to raise funds for construction of a new fire house.

Many fire departments have been financed partially or in their entirety by local manufacturing companies or institutions seeking adequate protection. One Connecticut concern gave the land, built the fire station and bought a pumper for it, when the town's local fire house burned.

The Textile Workers union helped finance a new fire company in a Virginia town. A number of other labor organizations have contributed substantial sums to volunteers for equipment and facilities.

Festivals are also widely employed in Pennsylvania as fund raisers. Usually a festival includes music by high school or other local bands, or orchestras; sales of food and other refresments; sometimes a rummage sale, and various other activities.

Cooperation of local motion picture and other theatrical interests frequently produces revenue for the volunteers, while promoting better fire prevention.

How One Town Did It

This is the recipe for raising money for the local fire department as given by the chief of a small Ohio fire department. Here's his letter:

"One of the first steps in raising money for a volunteer department is arousing the public to the need for the money. Every possible method should be used to acquaint the public with the department's difficulties and to keep the matter in the public eye. We all know we can't get the public to buy something it never heard of.

"We must go and talk with our local newspaper men, asking for their help. If we sell them on the idea of better fire protection, we will surely get liberal space in their papers. Contacting insurance companies also helps. They have engineers who can determine the exact needs of any community, and often will provide speakers for public meetings. These men are familiar with all phases of fire protection, and are expert in putting over the message.

"Another valuable contact is through those who are prominent and popular in the town. Tell them your problem. Ask them to talk up the matter to other citizens, pointing out the benefits of better equipment for the fire department.

"We are assuming that the town council or government is broke—as most

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20 KEY FEATURES--YOUR GUARANTEE OF FOOT COMFORT, SAFETY AND LONG WEAR!

TOP NOTCH SIREN

3" HIGHER ST. KING LENGTH FOR QUICK ADJUSTMENT AND MORE PROTECTION

OUTSIDE, EXTRA RUBBER REINFORCEMENT ABOVE KNEE

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VULCANIZED BY AMMONIA CURE—PATENTED EXCLUSIVE FEATURE

SIX PLIES OF FABRIC AND RUBBER THROUGHOUT LEG

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FABRIC AND RUBBER IS "SHINGLED" TO DISTRIBUTE STRAIN

FOURTEEN PLIES OF FABRIC AND RUBBER WITH SPECIAL FRONT STAY

MADE OVER SPECIAL LAST, FULLER THROUGH THE ANKLE AND INSTEP

NINE PLIES OF FABRIC AND RUBBER AT THE VAMP

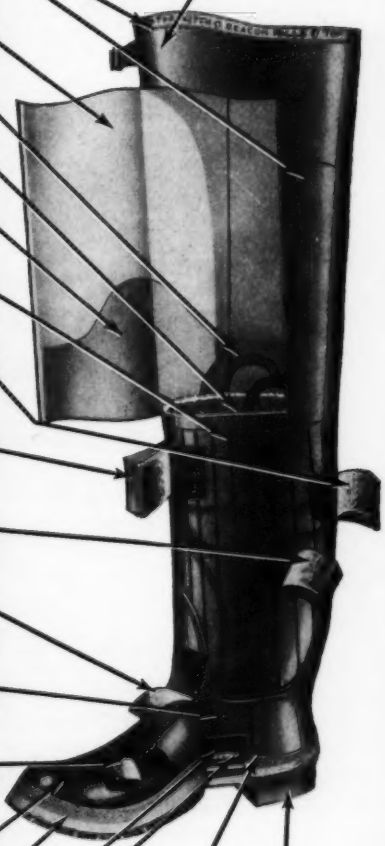
REINFORCING TOE CAP PROTECTION

EXTRA THICK SUPER-QUALITY SOLES

FELT COVERED CUSHION INSOLE

REINFORCED LADDER SHANK

SPECIAL HIP WITH HIGH FRONT SKIRT, ALSO IN SHORT HEIGHT



FULL SIZE HEEL

THICK SIDE GUARDS AT SHANK-PROTECTION AGAINST NAIL OR SPLINTER PUNCTURING

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are. You can still go to them with your needs, and keep after them until there is some action. That is one of the duties of a community government, to find ways of obtaining funds for essential services. When you have the public behind you, the officials will be more anxious to cooperate.

"Anything you do to keep your department prominent in a favorable light is to your advantage. Offer to inspect homes and suggest correction of hazards; do your work efficiently at all times, of course.

"Having aroused public attention, try to get a little of their money. You can do this by any or all of the following methods, if your need for money has been presented.

"Sponsor dinners, suppers, parties, dances at opportune times. Always be sure that you give people their money's worth, but of course do not spend so much to make things pleasant that you lose your profit.

"Stage a street carnival for a few days. By all means bring in everything possible to attract public attention. Invite neighboring fire departments for demonstrations and drills.

"A good revenue producer is to sell honorary memberships in the department for adults for a dollar or two. Try also to organize a Junior department, running it on a club form. Assign the kids some small jobs that look important and charge perhaps 50 cents each to join. Give them a cheap but impressive badge and play them up in the papers, and you will make friends of all of them for life, in addition to getting those half dollars.

"Put up collection boxes in strategic locations. You know that every penny helps, and if you don't collect much, at least you'll be advertising.

"Firemen's wives can run bake sales. What you don't sell you can try to eat.

"Make arrangements with managers of local theatres for special fire department nights when you get a split of the admissions. Enlist Boy and Girl Scouts to sell tickets for these evenings.

"Hire a photographer on a percentage basis, and have him take folks' pictures in boots, coats and helmets, on the apparatus, for a fee.

"These are all simple ideas, and can be varied greatly. It will not be an easy matter to get important money together. But it can be done by sticking noses to the grindstone. And people are most apt to support a department that shows its willingness to go out and earn some of the money it needs.

"Once a department wins full public support it is not a difficult matter to keep it. My idea on this campaign is to get the people on your side and give them a good time for the money you get from them."

Not long ago this author attended a meeting of a group of volunteer firemen called for the purpose of assisting a small nearby community to organize a fire department. The Chief of the host department told how they got their fire truck. He, and four fellow firemen made out a personal note to the bank to buy a chassis and a surplus O.C.D. pump. Then they held oyster suppers and raised donations to retire the note. Next they signed another note to replace the O.C.D. unit with a midship pump, and got some hose. And again they had to raise money to pay the bank. This was done, and the next step was to get ladder equipment and enclose the pump compartment. Again they gave the bank their personal note.

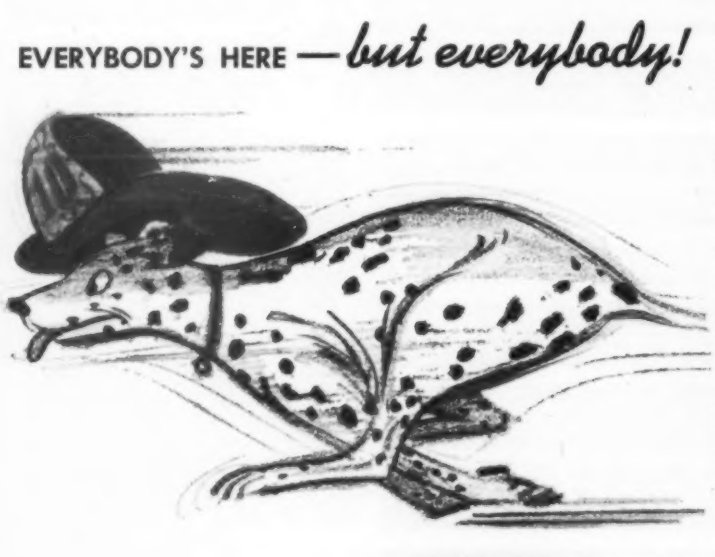
This was a little place of 650 population that had bonded itself for a water system. If those vamps hadn't given of themselves, there would be no fire department. Their biggest concern is when they can improve their fire house, and install a standard piece of apparatus. Meanwhile, they're putting out fires and protecting property and lives of their area.

Efficient Operations Pay Dividends

One of the best dividend payers in a volunteer (or any other) fire department is a workmanlike, professional job of fire fighting. As the business saying goes "the pleased customer is the best advertisement." The best booster for a fire force is the householder or business man who has seen the local fire fighters not only extinguish a fire in his property, but go out of their way to reduce damage and restore premises and contents to their original condition.

The average property owner may admire his local fire department, but at heart he is pretty skeptical about the damage they may do to property in tackling a small fire. Hence the old wheeze "the firemen destroy everything that the fire doesn't." When he sees a well-trained and disciplined crew subdue a blaze in his home, office or factory, and notes how it is done with minimum damage by the firemen themselves in their use of water, in forcing entry, ventilating and particularly in overhaul and salvage, he is inclined to prove his pleasure in a practical way—by donating to the firemen's fund.

EVERYBODY'S HERE — *but everybody!*



Buckeye would like to be represented too. May we stick our head into the smoke-filled room long enough to say "Greetings!" from us to you . . . and to express the pleasure we take in the relationship this year, as in every previous year!

Buckeye

FIRE DEPARTMENT ACCESSORIES

BUCKEYE IRON & BRASS WORKS • Dept. E, Box 883, Dayton 1, Ohio

We have said that successful financing of a fire department is largely a matter of good selling. Good selling is possible only where there are favorable public relations. Good public relations must be developed in the fire service just as they are in business. In short, in raising funds, as in selling goods or services in business, people don't do business with those whom they dislike.

One of the first things those who head up fund raising campaigns must realize is this simple but illuminating fact. If the department is to swell its funds by public subscription, or any other way in which the public is involved, it must give value-for-value, and deserve public confidence.

It Pays to Mix in Affairs

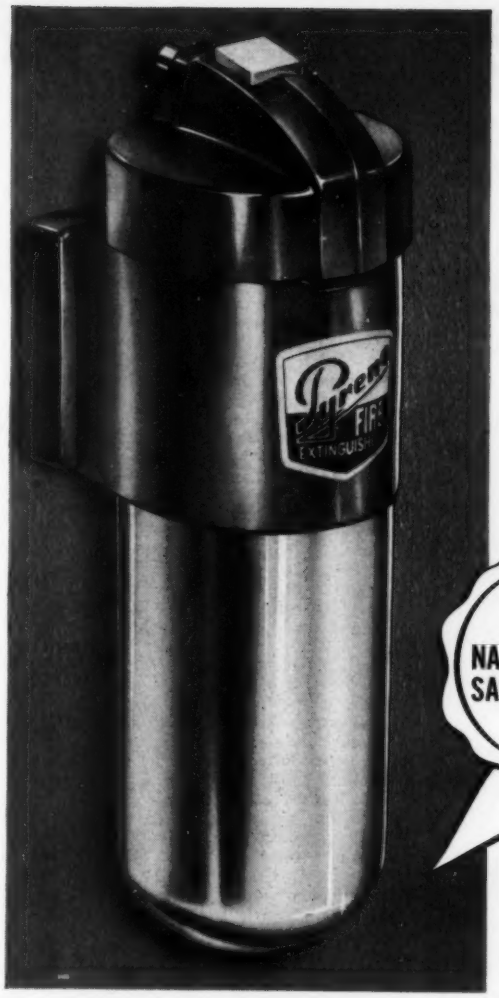
One factor which helps the volunteer department in its fund raising is its participation in the affairs of the community or area it serves. As one chief expressed it, "We have no trouble getting money when we ask for it because, first, we don't ask until and unless we have something definite we want to use the money for—and that use is in the town's interest; and secondly, everybody knows that the fire department is active in all public and civic developments.

We stage a fair once yearly and the returns maintain our department. But we go out of the way to help promote *other services* and enterprises in our town. We participate in religious, fraternal and other affairs. We subscribe to all the fund raising campaigns, including Red Cross, Community Chest and the like. We like to have our folks say, *"why don't you put it up to the fire department? They'll try to help you"*—no matter what the problem is.

There are countless cases of small fire departments that have won acclaim for their communities and themselves, by their public spiritedness and enterprise. A couple of years ago, to name a few, an Iowa town held a ceremony in which they burned a $10,000 mortgage the fire department had assumed on a large community building. The firemen bought the building and turned it over to the city after it was fully remodeled. This department also bought, landscaped, and flood-lighted a community athletic field. Much of that money was derived by the department from various promotional campaigns, sports contests, social gatherings, carnivals, fairs, and so on. The point in this case was that the department did not attempt to merely fatten its treasury for its own selfish interests, but it made a point of turning back a percentage of its "take" for the good of the community.

In another midwestern town the fire department bought and paid for a walk-in type of refrigerator for the hospital. The number of resuscitators and other medical and first aid equipment purchased with funds of volunteer firemen is countless.

The affairs supported by volunteers' financial contributions and member cooperation are also not countable. One Iowa volunteer fire department keeps a skating rink flooded for the use of the community during winter time. Another western volunteer outfit sponsors a public swimming pool; still another organization during the fall of each year conducts a rat eradication campaign that has proven outstandingly successful.



The new precision-made Pyrene* push-button fire extinguisher specially designed for home and car protection. Price, just $7.95. Weight filled, only 2½ lb. Shoots 20 ft. stream of vaporizing liquid. 1 pint capacity. Only two basic pieces —head and shell. No moving parts to get out of order. Easily inspected and readily recharged at a gasoline station air hose.

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NATIONAL HOME SAFETY AWARDS
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EVERY HOME YOU SERVE SHOULD HAVE THIS EXTRA PROTECTION

849 homes are *too many* homes destroyed by fire every day. 8000 lives are *too many* lives lost in home fires every year. Something has got to be done about these losses. We at Pyrene have long been convinced that preventive efforts are not enough. We firmly believe that every home should be equipped with *at least one* dependable, easy-to-use fire extinguisher. That is why we have developed the push-button fire extinguisher pictured and described above. You can recommend it with confidence and know, as you do so, that you're making a real contribution to fire loss reduction in your community.

If you wish to raise funds for your organization easily, we can arrange to have you purchase these Pyrenes from a nearby source at a price that will put a tidy sum into your treasury for every one you sell. Get the complete facts for your next meeting. Write us today.

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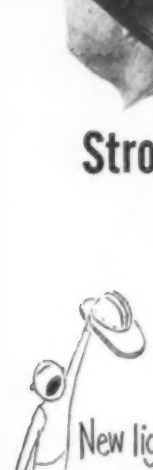

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Hard Boiled

FIRST Name in Safety Hats—*since 1919*

And then, of course, there are the athletics financed and encouraged by the volunteers. Nearly every part of the country has its baseball leagues, both for teenagers, and within the volunteer departments themselves. Uniforms and equipment are purchased by firemen, together with prizes.

Still another outstanding use of volunteer firemen's funds is the support given the Boy and Girl Scouts of America. In a number of New York State counties, Scout Troops are supported entirely on funds donated by the firemen. And many fire fighters serve as Scout Masters. A suburban New York City volunteer department of five companies paid the entire expenses of selected Scouts to the recent western "Jamboree."

True, this money came originally from the pockets of the citizens, including the volunteers themselves who pay for the privilege of being firemen. But the fact that firemen do use the funds they collect for the public good is often overlooked by those whom they serve.

It cannot be denied that there are volunteer fire organizations that have brought disrepute upon the entire volunteer fire service, for one reason or another. One cause, in particular, are the methods employed for raising funds. Sometimes the volunteers are merely the front, or instrument, for a commercial outfit, such as a carnival or show company, which gets about two-thirds of the gate. Fortunately, however, of late years two things have happened: (1) local civic officials and public have frowned upon the "hold up" ticket-selling tactics and (2) in many parts of the country laws have been passed prohibiting, or regulating the type of money raising schemes advanced by these itinerant promoters.

Sometimes, it must be admitted, the enthusiasm displayed by the volunteers in their efforts to build up their treasuries is misplaced. And occasionally it backfires. Such has been the case in the State of Connecticut, where volunteer fire department financing included the more or less promiscuous selling of fireworks, even to the point of setting up fireworks stands on fire department property. Some years back, Long Island volunteer firemen were criticized because of this practice and today it is outlawed pretty generally in New York. Of all the things, it would appear volunteer firemen should refrain from selling, or participating in selling, fireworks. The chief of a New Jersey volunteer fire department unburdened himself on this point. He said: "Last Fourth we had a youngster severely burned by fireworks 'bootlegged' into town by motorists who picked them up on a highway going through Connecticut. My entire department was accused of being responsible just because the gossip got around that 'volunteer firemen' were responsible for the sale of these fireworks. I'm glad the State of Connecticut has put the lid on such efforts to raise money."

Perhaps the question has entered your mind, why should a fire department go to all this work and bother in order to raise money? Why not let someone else do it?

The chief of a small township fire department answered it this way: "If you take any interest at all in the welfare of your community, it is your duty as a citizen, and your fire department as an organization, to take an active part in civic enterprise. I firmly believe that the little we have done for the community has established a good name for the fire department of our town. Our work with the community has been the means of our Council purchasing us a resuscitator, and seldom do we make a run to a fire but what we are reimbursed by the individual; or in the business district the firm always remembers us. The good word that we get from the press and community goes a long way, financially and otherwise, with us. We receive two dollars for each fire call, but in return we give long hours of time and labor in working with civic organizations. Our annual Fireman's Dance and picture show," the chief went on, "has tripled in ticket sales and donations. Besides the dance, we rent the theatre so that those who do not care to dance may use their tickets at the theatre." He added, "We have a substantial general fund and a lunch fund that pays for our lunches twice a month, and we also support our Ladies' Auxiliary to the fire department."

This chief concluded with this advice: "If every chief will put in a little more effort, win the confidence of his men, and then set out to take part in civic events in his locality, I'm sure it will yield him big dividends. Incidentally, this chief works on the railroad 8 hours a day from six in the morning, and he devotes much of his remaining time to the fire department.

Today's Equipment

(*Continued from page* 802)

the ground. When told that a man remained in the fourth half-floor under the roof (the windows of which were too small to enter) he reached the roof by his ladder, broke through its slate covering, went down through the hole he had made and found and brought up the nearly-dead man in time to save him.

It was said that he had saved no less than 168 lives, a record that few if any modern truck companies with aerial ladders have ever approached.

It is an interesting fact that each ladder had, suspended from its head, an escape chute of canvas, the lower end of which was held by persons on the ground. Many persons brought out of upper floor windows were placed in these and allowed to slide safely to the ground. Such devices have recently been demonstrated at conventions of American fire chiefs, and many persons seeing them have thought that they were looking at a new invention.

Example 2. The members of a professional salvage corps are described as working with firemen, in the eighteen-fifties in London, in preserving property from loss by fire. They were employed by insurance companies.

Example 3. The self-propelled pumper is by no means a product of the century we are in now. Some of the first successful steam fire engines manufactured were made to move by steam propulsion. One of these was in regular use in the fire department of Cincinnati, Ohio, in 1873, and I have seen a picture of one that appeared to bear the date of 1852. Many of these "self-propellers" continued in use until the gasoline driven pumper became practical.

Example 4. The use of leader lines of 1½-inch hose in fighting fires is regarded generally as of quite modern origin and has been extended greatly

by the teachings of state and regional fire schools in recent times. These lines are operated by being connected to controlling nozzle tips or to siamese connections on 2½-inch hose lines.

Here are three bits of evidence that this practice is more than fifty years old:

A. The writer, at the age of twelve, kept a notebook in which he wrote down everything he saw at a number of fires that occurred in the city of Mobile, Alabama. Here is an extract from this note book, written at the scene of a fire on the second floor of a hat store on Dauphin Street, Mobile, on March 6th, 1903. A line of 2½-inch hose had been carried up a ladder and into a second floor window by Engine Company 2, under Captain Henry A. Dolle.

Here, in pencil, and in a boy's handwriting, is inscribed:

"Flames were visible leaping up inside. But the heavy stream swept here and there with effect . . . *the little attachment hose was pulled up and connected with the big nozzle.* In a short time the fire was out."

B. Another notation, from the scrawled paragraphs in the same book, was written at a fire in a large two-story frame residence, in Mobile, at the southeast corner of Hamilton and St. Anthony Streets, on March 24th, 1903.

It states: "Creole Steam Fire Co. No. 1 got first water on it.

"Hook and Ladder No. 5 put up a ladder. No. 1 ran out a line of hose.

"The tip of the big nozzle was unscrewed and a line of smaller hose was coupled on and it was carried to the roof and into the attic."

Both incidents described above are certainly cases of the use of leader lines of 1½-inch hose in Mobile, Ala., fifty years ago. During the summer of 1902 the writer, visiting a fire station in Mobile, was shown by Captain H. A. Dolle, mentioned above, some 1½-inch hose, with a controlling nozzle that was carried on a hose wagon, and Captain Dolle showed the visitor how the tip of a controlling nozzle for 2½-inch hose was unscrewed and the leader line coupled on.

The writer also has information that in the city of New Orleans, before the Civil War, lines of hose about 2-inches in diameter, or slightly smaller, were used from some of the hand engines at residence fires instead of 2½-inch and were preferred because they could be handled easily.

C. There is, also, before me at this moment another book, a large volume containing an assortment of entertaining and educational subjects that included history, literature, music and art. It was called "Shepp's Giant Library" and was published by the Globe Bible Publishing Co., of Philadelphia. It came into the possession of the family of the wife of the author in 1897 or 1898.

Within it are reproductions of a number of famous paintings.

One, by an artist named Devoir, shows a fire scene in a European city.

Several steam fire engines of a very early type are to be seen in this, among other apparatus units and, on the pavement of the street and in the foreground lie a number of lines of hose apparently (in the equivalent of metric measurement) 2½-inches in size.

At least four of these, plainly visible, are siamesed (by Y-connections with gate valves similar to ones in use now) each into two lines of 1½-inch hose.

This book was printed in 1897 and this

X MARKS THE SPOT IN TOLEDO

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Chief Arnold F. Papenhagen

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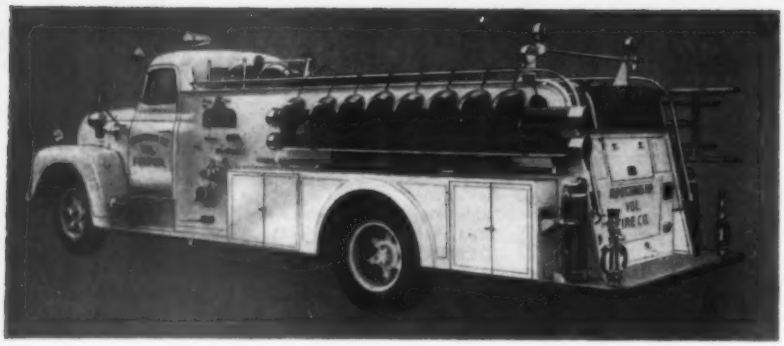

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picture must have been painted some time before from a scene actually viewed by the artist.

In addition to the above it is of interest to know that there existed in an American harbor, in 1815, a steam vessel with the essential equipment of a fireboat.

Robert Fulton, it is recorded in history, built the first steam war vessel in 1815. A book, published eighteen years after this was done mentions, as part of the design of this craft, "an engine which will discharge an immense column of water." It is written that this was made to sweep the entire decks of other vessels.

Detroit Auxiliaries

(*Continued from page* 804)

pumpers and 240 fire fighters) are scheduled for Detroit which, upon orders of the CD director, can be dispatched to any part of the state. County fire plans in the metropolitan area are nearing completion, which provide automatic response and call-up of reserves. The entire State of Michigan's fire fighting strength can be made available to any stricken community for either enemy attack or normal disaster.

Juveniles

(*Continued from page* 806)

able to hit the fire from all four sides of the building.

Three boys, ages 8, 9 and 11 years, confessed to starting this fire as well as several other mysterious fires which have occurred in Richmond recently.

A very large amount of unused printing paper was either destroyed or damaged by water. It was the second multiple alarm fire in the building in a year. The alarms were recorded as follows:

7:02 P.M.	Box 141; Engine Cos. 3—4—5—7; H&L Trucks 1—2
7:06 P.M.	2—2—141; Engine Cos. 1—6—9; Rescue Co. #2; Foamite #2
7:09 P.M.	3—3—141; Engine Cos. 2—10
7:11 P.M.	10—1—2—141; Engine Co. No. 12
7:11 P.M.	10—1—4—141; Engine Co. No. 14
7:11 P.M.	10—4—3—141; Hook & Ladder No. 3

In about 45 minutes the flames had been knocked out by the fire fighters under the guidance of Chief John Finnegan and, in the opinion of this writer who has seen thousands of fires, this was the best job he had ever seen.

TOM MONDY

Modesto Gets Class 2 Rating

Modesto, Calif., firemen are happy over the granting of a Class 2 fire insurance rating to their city which will save local citizens between $50,000 and $75,000 annually in fire insurance premiums.

To obtain the new rating, incidentally the only one to be granted an American city under 25,000 population, the city had to eliminate nearly 500 deficiency points. Improvements included a new map and record system for the water department; 31,000 feet of new water line; improvements in the system of hydrants; additional fire department personnel and equipment; radio and other communications improvements, and a fire prevention program, including home inspections.

Book Shelf

FIRE FIGHTING TACTICS. by Lloyd Layman, National Fire Protective Association, 60 Batterymarch St., Boston 10, Mass. Cloth bound, 5¾ x8¾ in., 112 pages, 25 illustrations, $3.75 per copy.

Lloyd Layman was former chief of the Parkersburg, W. Va., Fire Department and author of the book *"Attacking and Extinguishing Interior Fires."* He is widely known for his advocacy of the use of water fog both for direct and indirect application upon fire.

This latest volume is a revision of his first manual published in 1940; it is intended as training outline to enable officers and future fire officers to familiarize themselves with the analyses and direction of fire operations. In the 11 Chapters contained in the volume, the author briefly sums up the factors officers should consider when they encounter a fire, including tactical and operational planning. The Chapters also include size-up, rescue, exposures, confinement, extinguishment, salvage, and overhaul. There is also a chapter of case histories of fires fought by the Parkersburg Fire Department.

Not every fire protection engineer and fire officer may agree fully with all of the theories and contentions advocated by the author in this and his previous manual, but no one will deny that this is a worthwhile contribution to the literature on the science of fire fighting.

With Our Readers

Value in F. D. Photography

To the Editor:

Thank you very much for the article in your June issue titled "They Fight Fire with Film."

I do believe there is a great deal of value in fire prevention and fire fighting with the use of moving pictures. I suppose we have pioneered a little bit in this field. I hope the article encourages other departments to take more interest in the use of this medium. In any event, you paid us a great service by running this article.

Sincerely,
JOHN H. ALDERSON
Chief Engineer, Los Angeles Fire Department

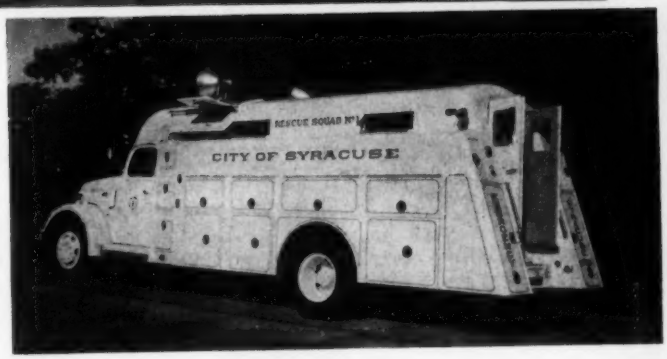
County Well Organized for C. D.

To the Editor:

I want to compliment you on your fine editorials that you have had in regards to Civil Defense. You are certainly doing the firemen a big favor by constantly letting them know that they do have a big responsibility and should be doing their part during this emergency.

We here in Johnson County, Kansas, feel that we are partially organized and prepared for a disaster. On Sunday, April 26, Kansas City, Missouri, conducted a mock bombing entitled "Wake-Up" exercises. Under our Mutual Aid Pact there are ten fire departments with two pieces of equipment that had signed up to participate in case of an emergency. The convoy formed at 12:30 P.M. with all ten of the pumpers and

(*Continued on page 869*)



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FIRE DEPARTMENT MOVIES REDUCE LOSSES AND BUILD GOOD WILL

South Portland, Me., Firefighters Produce Own Films for Public Showing and for Department Instruction

IN a matter of minutes today, the active program chairman of almost any progressive civic organization can locate free moving pictures for his next meeting. Air lines, railroads, automotive dealers and the armed services are quick to offer free movies covering their own selected short subjects. Thus an aggressive fire department today must include movies as part of its public relations program for it is becoming increasingly difficult to merely offer a "speaker" before any group of citizens.

With this in mind, the South Portland, Maine, Fire Department has been building up a film library of its own over the past dozen years until the fire fighters now have twenty reels on hand available for showing upon request. Over 6,000 persons saw these films last year, which represents about twenty five percent of the city's population. Present figures indicate that this number will be topped this year.

For twelve years a 16 mm. movie camera has been standard equipment in the car of Chief Horace S. Jose, and on many occasions there have been opportunities for making good pictures. The impact of showing local fire scenes to local groups cannot be over-emphasized. It really brings home the idea that fire can be destructive right in one's own neighborhood.

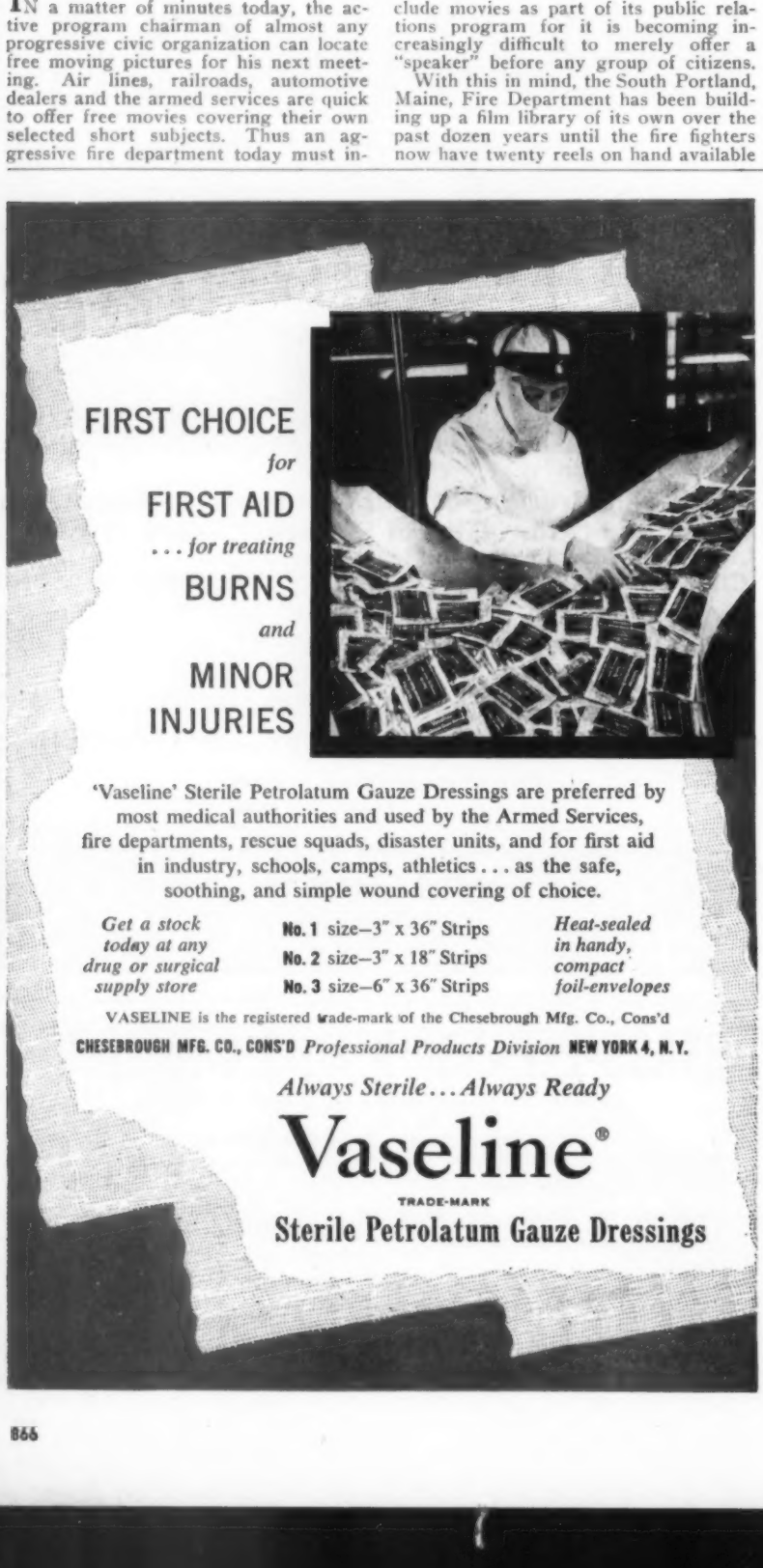
For the fire chief who may be considering entering the movie field, the experiences of South Portland will show that the initial steps need not be out of reach financially of even the leanest budget. The department's camera was purchased second-hand in 1941 at a cost of twenty dollars. It has seen continuous service and many thousands of feet of color film have ground through it. The first showings were made only where a projector was available, as the firemen did not obtain one in the beginning, knowing that most schools and service clubs have such equipment available.

The first footage was a hodge-podge of action shots at fires, but as this creased it became evident that there might possibly be a story in the sequence. The firemen-cameramen dubbed their first effort *"The Fire Inspector,"* and shot scenes of an inspector making his routine calls and showing common household fire hazards. With each hazard outstanding fire scenes were cut in. The cameramen were fortunate in securing considerable footage of some red shirted veteran firemen working out with a hand-engine, and they worked this in by way of contrast with present day equipment, which enabled them to show off their own modern apparatus. The High School Art and Printing classes lent the firemen a hand in making up titles and the result was a creditable film, which was in much demand from the outset, and is still one of the most popular films in the library, inasmuch as footage showing spectacular local fires is added to the reel, as occasion permits.

Film on Fog Equipment

A few years ago the South Portland Fire Department began a series of aircraft rescue drills, starting with small fires involving twenty gallons of gasoline and working up to a 2,000 gallon gasoline fire staged last fall. Standard fog nozzles and fog heads were used all the way and all of these drills were covered by the movie camera. The films show how the men progressed from a period of hesitancy to advance into the fire, to the time when they became masters of the situation. This film titled *"Fog, Foam and Fire"* plays up the department's fog equipment and shows what can be done with it. The foam angle will be worked out at drills during the summer months.

A third film, shot last year, is called *"This is Your Fire Department."* Its opening scenes show representative areas protected by the South Portland department; action shots show each engine, ladder and tank truck rolling out of quarters in response to alarms. Following this, a typical pumper, aerial and foam unit is stripped of all equipment and the appliances demonstrated. Show-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ing this film before local citizens gives them a pretty good idea of what their fire department really consists. It has proven an eye-opener on more than one occasion before service clubs and other groups.

False Alarm Hazard Filmed

The present picture schedule calls for the filming this summer, of a movie covering the false alarm hazard. This film will be placed in the local schools this coming fall. The cameramen already have scenes of a fire truck involved in a traffic accident to work into the reel as one dangerous aftermath of pulling a false alarm; considerable footage showing house fires are also on hand to visualize what could happen in the event of a delayed alarm resulting when a real fire occurred when apparatus was out on a false run.

Besides films of its own making, the South Portland department has several of the excellent Los Angeles releases in sound film and most of those offered by the National Board of Fire Underwriters, including *"Tony Learns About Fire," "Crimes Of Carelessness"* and the new series, *"How To Call The Fire Department,"* etc. Also in stock is the U. S. Forestry Department's film on the Maine forest fires of 1947 and the Mine Safety film, *"You Bet Your Life"* which to our way of thinking is one of the best training films yet produced.

The South Portland department makes a practice of showing movies outside its own city limits as a neighborly gesture upon request from fire departments or other groups. Twenty different fire departments made use of these films during 1952. The department's policy is to show the films on its own projector—the men now boast a new Bell & Howell 1,000 watt machine. Only qualified members of the department show these films, thereby insuring careful handling at all times.

This experience has proved that good movies are an excellent medium of public relations. The training films are booked in at each of the six fire stations throughout the winter months as part of the department's training program when weather limits the outdoor drills. Movies are shown before grade school classes, which spend a portion of each week studying various phases of home and highway safety. Representatives of the department are able to go before any civic group, lodge or church organization and favorably compete with any other group for audience interest and attention.

Lower Fire Losses Result

That visual education is paying off by lessened fire losses is evidenced by the fire loss trend in South Portland. The picture program developed, fire losses decreased. Public education on the dangers of fire has reached the point in South Portland where those in charge of this city's recent spring clean-up drive deemed such drive a failure. Due to the fact that our citizens are being educated to keep their rubbish accumulations to a minimum, there was scarcely enough rubbish set out in the spring clean up drive to make the effort worth while!

It is the considered opinion of Chief Horace Jose that any fire department that rightly employs good motion pictures today gains materially in its efforts at better public relations.

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Mobil-Directo Sirens are POWER-PROVED! ABSOLUTELY DEPENDABLE! Give GREATER COVERAGE and DECIBEL OUTPUT at LOWER COST—QUICKER, EASIER, MORE ECONOMICAL INSTALLATION!

In performance, in power, in rugged construction, Mobil-Directo Sirens lead the field—assure constant operation even under the most rigorous climate extremes, and in the event of power failures (using gasoline-powered siren).

THAT'S WHY they were recently selected by the General Services Administration in Washington for the ten most important cities in Alaska!

THAT'S WHY they were used by the Armed Forces in World War II, and are still being used by the Armed Forces and in principal cities all over the country. In all that time, there has been NOT ONE case of mechanical failure!

And . . . **THAT'S WHY** . . . you, as a Civil Defense official should choose the air raid warning system that INSURES YOUR CITY'S SAFETY:

MOBIL-DIRECTO *ROTATING DIRECTIONAL* AIR RAID SIRENS

Mobil-Directo needs only ONE motor to do the work—other sirens need two or three! Can be remote-controlled by manual phone, electricity, or radio.

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MUTUAL AID PROVES ITSELF AT BIG MOTOR SERVICE FIRE

Five Outside Departments Respond with Apparatus and Fifty Men; Fire Confined to Building of Origin

ON the evening of July 6, fire gutted the building of the Mang Motor Co., at Kankakee, Ill. Starting upstairs at the rear of the building on a catwalk, the blaze had gained considerable proportions before it was discovered. Damage totalled $175,000.

Chief James P. Marnell stated that the flames burned through the tar roof and eventually the huge curved wooden beams caved in, hurling the fire to the first floor where it spread to all parts of the building.

The firemen directed streams through the front windows, the south side and from the roof of the Kankakee Auto Leasing Co. next door. The flames were brought under control about 7:45 P. M.

Injured while fighting the fire was Captain John Marquart who was rushed to St. Mary's Hospital for first aid treatment. He was hurt when he and several other firemen were in the garage entrance and the roof started to cave in.

They ran back to the street but the captain, who was holding a nozzle, backed out, tripped over a hose and fell backward, striking his head on the pavement.

The fire alarm was received about 6:40 P. M. and when the firemen got to the scene the flames were burning through the roof.

The chief immediately called in the fire departments from Bradley, Bourbonnais, St. Anne, West Kankakee and Aroma Park—all members of the Kankakee Valley Firemen's Association. He estimated that about 50 men helped fight the blaze.

The owner of the building praised the fire fighters for the quick and efficient job done in keeping the fire from spreading.

A crowd, estimated at more than 1,000 quickly gathered at the scene and, as the heat waned, crowded nearer to get a better look, but only managed to hamper the work of the firemen.

Police and sheriff's deputies quickly formed a fire line to push the people back, but the more curious spectators soon pushed forward again.

When the fire started, an auto salesman was in the sales lot south of the building demonstrating cars.

He said he looked toward the top of the building and saw smoke coming from a ventilator in the center of the building. He ran inside the building to report the blaze but the fire had already destroyed the telephone lines. He called across the street to the R. J. Chamberlain Motor Co., who turned in the alarm.

Under the direction of Police Lt. Curtis Fredd about ten autos in the parking lot south of the building either were driven or pushed to a safer place.

Some car windows had to be smashed to move the vehicles.

Chief Marnell said the explosion of auto paint, thinner and lacquer helped spread the flames. There were about six explosions during the fire. They were not serious but added to the rapid spread of the flames.

Firemen feared the blaze would spread to surrounding buildings and at one time the canvas awning at the front of Tolson Cleaners, Inc., caught fire.

Streams of water were played over the building occupied by Tolson's and another at the rear of the Tolson plant which contained flammable dry cleaning chemicals.

The heat of the blaze buckled the rear wall of the building and for a time it was feared the wall would fall. It bulged outward over the alley and police kept spectators out of the danger area.

A building of Uptown Sales, Inc., another auto firm, joined the Mang

Kankakee Daily Journal Photo

Kankakee Motor Company fire at its height.

building on the north side but the double fire wall prevented spread of the blaze or smoke to the Uptown building. Office furniture and other supplies were moved from the latter building to an adjoining display lot until after the fire.

With Our Readers

(*Continued from page* 865)

two chief's cars, along with two buses full of firemen. The fire equipment was radio-controlled. The convoy was escorted to different parts of the city by the Highway Patrol and Sheriff's cars.

This was a test for Kansas City, but we feel here in Johnson County, with a 100% participation on that test, that we are fairly well organized for an emergency.

Sincerely yours,
C. G. LIPPS,
Civil Defense Deputy Director,
Johnson County, Kansas.

Golden Valley

(*Continued from page* 810)

12 firemen hooked up on the department's own private line, and when various construction projects of the village are completed, all installations were expected to be completed to alert a total of 22 firemen.

This means that all firemen in the area served by the department can be summoned at the same time with but one long ring on the phone; at the same time the men can be given full information concerning the type of fire, location and so on. This results in a saving of up to 75% in time, which is an all-important item in rural communities. Our lowered insurance rate bears this out, said Mr. Hanover.

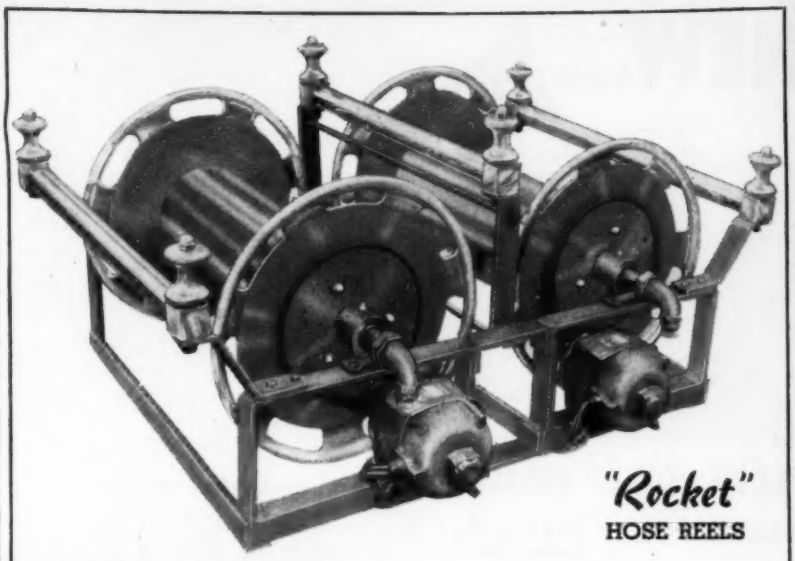
The telephone used is the modern version of the old style farm phone. It is operated by batteries having a long life span, and each phone is individually fused so as to protect the phone itself from lightening, shorts, etc. The system is broken in many places with protective devices to enable the department to spot any trouble as soon as it develops—but this is seldom.

What's Burning

THE following list includes fires of $10,000 loss and over in the United States and Canada for the month of August, 1953.

Month Ending August 31, 1953

Joiner, Ark.—Grammar school in Whitten community destroyed.
Berkeley, Cal.—Berkeley Gazette damaged. Paper touching pilot light.
Etna, Cal.—Miller Lumber Co. plant destroyed.
Laytonville, Cal.—Sturgis Lumber Co. mill destroyed. Sparks from welder's torch.
Los Angeles, Cal.—Fernwood Manufacturing Co., furniture manufacturing plant, damaged.
Los Angeles, Cal.—Western Wood Excelsior Manufacturing plant and adjoining Aspen Products of California and Royal Products plant destroyed.
San Francisco, Cal.—Italian freighter Tritone at Pier 44. Extensive cargo damage. Spontaneous ignition.
San Francisco, Cal.—Metal plant near Third and Townsend streets, damaged. Defective heater.
San Jose, Cal.—Tallow factory, Bayshore Highway, damaged. Spontaneous ignition.
Santa Monica, Cal.—Army-Navy Club destroyed.
Vacaville, Cal.—Gymnasium of old Vacaville Union High School and a fruit drying shed on Sally Long Ranch, destroyed.
Woodland, Cal.—Melon packing shed of Rose



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Heavy-duty, Water resistant, and Explosion-proof motors, equipped with push-button switches and solenoids.

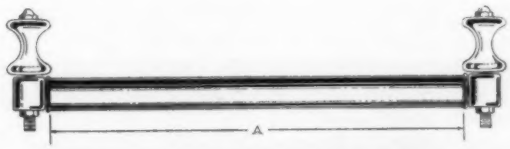
Heavy, cast aluminum-alloy reel ends.

Positive brake of new design.

Silent chain drive.

Brass hose connection through drum, designed to eliminate humping of hose at coupling.

ALL "Rocket" Reels are now furnished with Chiksan, Ball-Bearing Swing Joints, to stand pressures up to 1000 lbs. PSI.



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Hose rollers may be had in any length, and are adaptable to any make reel.

The horizontal or long roller is 2" heavy Aluminum-alloy tubing. Vertical end spools and bearings are made from solid aluminum bar stock, all highly polished.

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Minnesota Fire Equipment Co.

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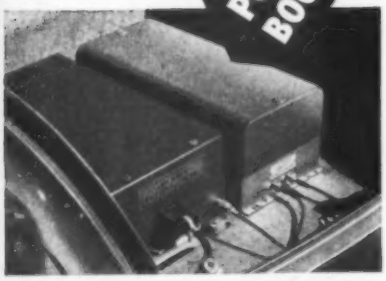
POWER BOOSTER



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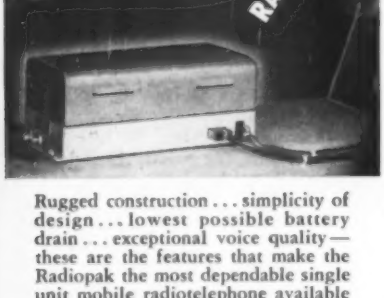
RADIOPAK



Rugged construction . . . simplicity of design . . . lowest possible battery drain . . . exceptional voice quality—these are the features that make the Radiopak the most dependable single unit mobile radiotelephone available today. Furnished for both the 25 to 50 mc band and the 152 to 174 mc band, the Radiopak is ideally suited for use in police cars, taxis, fire department vehicles, trucks, and three-wheeled motorcycles.

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Kaar is the only major radiotelephone manufacturer selling through authorized dealers. Write for complete information.

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ENGINEERING CORP.
MIDDLEFIELD ROAD • PALO ALTO, CALIF.

Valley Produce Co. destroyed.

Colorado Springs, Colo.—Summit House atop 14,100-foot Pikes Peak, destroyed.

Denver, Colo.—Evergreen Specialty Co. shops and storage areas, destroyed.

Coeur d'Alene, Ida.—Dealers box factory destroyed.

Fairfield, Ida.—Henry Bauscher and Sons grain elevator destroyed.

Orofino, Ida.—Lewiston Grain Growers elevator destroyed.

Centerville, Ia.—Gamble store destroyed and adjoining J. C. Penney store and Davison Hardware Store damaged.

Winfield, Kans.—C. R. Anthony dry goods store destroyed.

Richmond, Ky.—Dixie Hotel, two two-story buildings housing businesses and apartments and a one-story frame building in business section destroyed. Exploding gasoline tank of a truck.

New Orleans, La.—Ace Lumber & Box Co. destroyed.

Windham, Me.—Plant of Baker Refrigeration Co. and buildings of Maine Steel Co. damaged.

Vienna, Md.—Buildings of Southern Excelsior Mills, Inc., Route 331, destroyed.

Boston, Mass.—Ship chandlery of W. A. Hamel and John G. Murray and New England Propeller Service damaged.

Revere, Mass.—Hotel, restaurant and an amusement game along Revere Beach boulevard, damaged.

Bay City, Mich.—Bradley Miller & Co. woodworking plant destroyed.

Harbor Beach, Mich.—Huron Milling Co. food seasoning plant, damaged. Explosion.

Livonia, Mich.—General Motors Corp. transmission and instrument plant and nearby Terndstedt division building, destroyed. Spark from welding torch.

Brookhaven, Miss.—Ten Negro dwellings and crate department of Columbus Lumber Co. destroyed.

Crystal City, Mo.—Liberty Creamery on U. S. Highways 61-67, destroyed.

Kansas City, Mo.—Air Force community center at Grandview Air Base, destroyed.

Rolla, Mo.—Martin Motel on Highway 66 destroyed.

Camden, N. J.—Carpenter shop at Quigley Shipyard destroyed.

Elizabeth, N. J.—Offices and showroom of Ring Bros. on Route 1, damaged.

Mt. Holly, N. J.—Barn loaded with 125 tons of hay on John A. Hancock farm, near Jacksonville, west of Route 206 and a few miles northeast, destroyed.

Perth Amboy, N. J.—Two auto stores and a restaurant in building at 146 New Brunswick avenue, damaged.

Plainfield, N. J.—Music studio at 321-325 Park avenue and apartments damaged.

Runnemede, N. J.—Runnemede Supply Co. warehouse damaged.

Whippany, N. J.—Storage shed of Aquex Development & Sales Corp. on Route 10, destroyed.

Barrington, N. Y.—Barn of Henry Shoemaker destroyed.

Charlotte, N. C.—Perfection Stove Co. warehouse and three other business concerns including Grice's Garage, Grice's Florist Shop and Floyd's Auto Glass Shop, destroyed.

Casselton, N. D.—Elevator containing 12,000 bushels of grain, destroyed.

Akron, Ohio—Park's Truck Shop and Cummins Diesel Sales Corp. destroyed.

Cambridge, Ohio—McCreary Motto Co. plastic novelty plant, destroyed.

Cleveland, Ohio—Columbia Refining Co. yard destroyed. Huth Oil Service and Perma Welding Co. damaged.

Cleveland, Ohio—Dougherty Lumber Co.'s E. 68th st. yard destroyed.

Cleveland, Ohio—Hough Avenue Baptist Church destroyed.

Parma, Ohio—Parma's plush Hilltop Tavern, destroyed.

Toledo, Ohio—Balduf Bakery, Red and White Grocery, B & M Radio Service Store and office of Dr. Julian Laishley, dentist, destroyed.

Wauseon, Ohio—Morris Motor Sales damaged.

Ashland, Ore.—Bush Motor Car Co. destroyed.

Hauser, Ore.—Whalebone Cafe destroyed.

Klamath Falls, Ore.—One full block of business establishments destroyed.

Parkland, Ore.—Parkland Lumber Co. destroyed.

Portland, Ore.—Walters Auction House destroyed. Spontaneous ignition.

Yoncalla, Ore.—Yoncalla Lumber Co. sawmill destroyed.

Fairfield, Pa.—Shoe factory of Fairfield Shoe Co. in Adams County destroyed.

Lancaster, Pa.—Ballroom at Maple Grove Park destroyed.

Philadelphia, Pa.—Blue Bird Food Products Co. destroyed.

West Chester, Pa.—Barn on property of West Chester Airport, near Route 202, a mile south, destroyed.

York, Pa.—York Furniture Center and Shive's Furniture Co., in downtown, destroyed.

Cookeville, Tenn.—Bill Smith Machinery Co. plant, two tractors and a truck damaged. Royal Tire Service Co., next door, damaged.

Every Up To Date Fire Department Needs

The New

"FORCED AIR" SMOKE EXHAUSTER

Lighter in Weight
More compact—
Easier to Handle—

The large volume and strong blast of air delivered by the "FORCED AIR" Portable Exhauster, together with its small size and light weight, makes of this unit a valuable addition to Rescue Squad Wagons, and all Fire Trucks for the purpose of expelling poisonous fumes, gases or smoke. It enables fire fighters to enter a building faster and more safely and stops much smoke damage. Being small and compact it can usually be carried on the running board of most fire trucks. Unit is sturdily constructed and will withstand hard usage.

The New

"FORCED AIR" HOSE DRYER

Dries Hose Faster
Than Any Other
Method

"Forced Air" Hose Dryers are new—modern and different. They come in three models, 100—200—300, each with a capacity for 500 feet of 2½" D. J. fire hose, 220 volts, 60 cycles. Two 3100 watt 'fire type' heating elements. Two special thermostats — Dayton 'Squirrel Cage' forced air fan. Finished in aluminum or red at extra cost. Electric time clocks may be had at slight additional cost.

THE NEEP EQUIPMENT COMPANY
326 N. W. BROADWAY
PORTLAND 9, OREGON

Memphis, Tenn.—Bluff City Storage Co., Bluff City Warehouse Co. and Caradine Co., wholesale grocery firm, destroyed.
Nashville, Tenn. — Blevins Popcorn Co. plant damaged.
Breckenridge, Tex.—C. M. Bender Department Store destroyed; adjacent Peeler Printing Co. Building and Merrill Appliance and Sporting Goods Store, damaged.
Fort Worth, Tex.—Northwestern Compress Co. damaged.
Wichita Falls, Tex.—Stockroom at Sears, Roebuck & Co. store, damaged.
Parawan, Utah—Parawan Mercantile Store destroyed.
Hampton, Va. — Owings Moving and Storage warehouse damaged.
Winchester, Va.—Barn on John W. Larrick, Jr., farm, four miles west, destroyed.
Bellingham, Wash. — Indian Agency offices, Lummi Reservation and adjoining dwelling, destroyed.
Bremerton, Wash.—Retsil Veterans Home destroyed.
Castle Rock, Wash.—L. & S. Lumber mill destroyed.
Elma, Wash.—Elma Cedar Shake Co. destroyed.
Port Townsend, Wash.—Stephen Bishop Farm, destroyed.
Prosser, Wash.—Fry Alfalfa feed mill destroyed.
Seattle, Wash.—Playland Amusement Park damaged. Weed fire.
Spokane, Wash.—Storage warehouse of Washington Brick and Lime Co. destroyed.
Tacoma, Wash.—Army Supply Warehouse, Five Corners, destroyed.
Balsam, Wis. — Twin Town tavern, ten miles northeast, destroyed.
Chilliwac, B. C.—Aitken Bros. sawmill destroyed.
Duncan, B. C.—Evans Lumber Co. mill, three miles from here, destroyed.
Swan Lake, Man.—45,000 bushel grain elevator destroyed.
Monastery, N. S.—Monastery Hotel, warehouse, dwelling and two tourist cabins, destroyed.
Chatham, Ont.—The Thamesville Cooperative feed mill, 18 miles west, destroyed. Lightning bolt.
Cobourg, Ont.—Cobourg Recreation Center destroyed.
Kingston, Ont.—Building housing Adams Furniture Store and Bond Clothing Store damaged.
Richmond Hill, Ont.—Parisi Family Store destroyed.
Toronto, Ont. — White Hardware Warehouse, Ltd., new wing and stock, damaged.

Annual Reports Received

More Fires But Lowered Losses in Akron

The Akron, Ohio, Fire Department, Chief F. C. Vernotzy, answered 198 more calls in 1952 than it did in 1951—2,598 against 2,400, with 132 more fires, and 56 more false alarms than in the year previous; nevertheless fire losses decreased $812,305, or 57%; a per capita drop of $2.97.

Chief Vernotzy's annual report is one of the few which tabulates the tests given pumps and hose, as well as including complete information on the fire prevention, training, signal, hydrant, financial and other administrative branches of the fire department. Not only are all the essential data included, but they are presented understandingly by means of charts and graphs.

Chief Vernotzy recommends building of seven new fire stations; the addition of 30 more men to the department as soon as possible; one new 100 ft. aerial ladder; two 1,000 GPM pumpers, and four passenger cars. Three motor scooters or bikes are wanted for fire hydrant inspection work and one-man emergency calls. Further, the Chief recommends a new modern fire alarm office and a building to house a training school.

* * *

Fire Losses Up in Salt Lake City

Fire Chief J. K. Piercey of the Salt Lake City, Utah, Fire Department in his Annual report for 1952 lists losses as $391,688 compared with $216,692 for 1951.

The total number of alarms was 2,213, of which 107 were false. Apparatus was in service 1,641 hours compared with

No lubrication necessary
Carbon bearings (oilless)
2 Piston-finished stainless steel shafts
Bronze housing (Oberdorfer alloy No. 741)
Bronze spur gears (Oberdorfer alloy No. 16438)

the new
OBERDORFER
BRONZE BOOSTER PUMPS

These booster pumps with oilless bearings will last 3 to 5 times longer than the old style equipped with plain bronze bearings. As a result of closer machining tolerances, over 20 feet of suction lift may be depended on.

The No. 13 and No. 26 Oberdorfer Pumps are more fool-proof than they have ever been. When you get to a fire you have something you can count on. It isn't necessary to wear pumps out checking them periodically to see if they will work. These pumps are metering pumps in principle and therefore must produce the same volume for every revolution of the drive shaft.

PERFORMANCE DATA—No. 26 and No. 13 PUMPS

Pump No.	Pump Shaft R.P.M.	Pounds Pressure	Hose Length and Size	Dry Suction Lift in Feet	Vol. in Gal. Per Minute
26	1600	120	500'—1½"	20'	150
13	1600	120	500'—1½"	20'	75

LIST PRICES — No. 26 — $200.00 No. 13 — $90.00
Slightly higher west of Rockies

FIRE PUMP DIVISION, Oberdorfer Foundries, Inc., Syracuse, N. Y.

WATER when and where you want it!
with HARODIKES
Portable Canvas Water Tanks
THE ECONOMICAL AND EFFICIENT WAY TO CARRY AND STORE WATER.
ON THE JOB - ON THE SPOT
KEEPING AMERICA GREEN
EXCLUSIVE FEATURES
• Self Supporting • Easily Back-packed
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Available in 150 & 300 gallon sizes
A WATER SUPPLY AT THE SCENE OF THE FIRE

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NORTH DIGHTON, MASSACHUSETTS

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in half the space!

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"10 CW"
ELECTRIC PLANT
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Mounted on truck or trailer, this 10,000-watt gasoline-driven plant provides power for floodlighting large areas, for power tools and other equipment.

Models for standby use available.

Take a good look at this new low-cost powerhouse! Offered also in 5,000-watt capacity.

★ Twin-cylinder, 4-cycle, horizontally-opposed, air-cooled gasoline engine
★ Extra-large, replaceable bearings
★ Full-pressure lubrication
★ High-tension magneto ignition
★ Extremely quiet-running
★ Completely equipped, ready to run

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Complete for Installation.
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Red Background. Polished Aluminum Letters.
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8-Inch Square.

CAST ALUMINUM
LIGHTWEIGHT
$5.50 Each
24 or More $5.00 Each
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Firemen & Chief Insignia in Place of Light.
Desired Inscription in Top and Bottom Panels.

BUILDERS OF SPECIALIZED RESCUE AND FIRE APPARATUS
RETAIL AND WHOLESALE ALL TYPES FIRE FIGHTING, RESCUE AND FIRST AID EQUIPMENT

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SAFETY EQUIPMENT CORP.
STATE HIGHWAY 22 P. O. BOX 155
DUNELLEN, NEW JERSEY

1,741 hours in 1951. Pumping time was 414 hours however, against 390 hours for the year previous. In 1952, apparatus traveled 20,018 miles compared with 15,389 miles in 1951 and 13,263 miles in 1950.

As usual, this city's Annual Report is attractively printed and edited.

* * *

1952 a Busy Year for Tel-Aviv Fire Brigade

From M. R. Hartman, F. O. Chief Mechanic, comes the Annual Report of the Tel-Aviv, Israel, Fire Brigade for the year 1952. It was a year of increased activity. There were 699 fire calls in all, 284 more than in 1951, as follows: 417 fire-calls (up 40); 8 collapsed buildings; 6 big floods; 11 other rescue calls; 24 false alarms; 204 special service calls (locked flats, etc.); and 29 return calls cancelled by the Brigade's two-way radio, after the engines had left the station.

The fire-calls dealt with included: 29 factories; 32 shops; 13 wooden huts; 6 warehouses (one with about IL. 1,400,000 loss) 26 vehicles; 29 electrical fires (switchboards, etc.); 77 residential flats; 27 central heatings; 145 field and 33 other different fire occurances. The number of fires and loss-per-month follows:

	No. of Calls	Loss IL	
Jan.	49	720	
Feb.	47	430	
Mar.	41	21,510	
Apr.	42	3,180	
May	82	28,360	
June	82	815	(Many fields)
July	77	1,410,980	
Aug.	64	73,000	
Sept.	56	17,265	
Oct.	46	41,625	
Nov.	53	16,050	
Dec.	60	70,100	
	699	1,684,035*	

*This is an increase of IL. 1,302,505 over 1951. (IL = Israeli Pounds; value of one IL, about $2.80.)

Vehicles traveled 61,126 Km. (approx. 38,200 miles) with only one minor accident. During 1952, the Brigade purchased breathing apparatus, smoke masks, hose, portable extinguishers, etc., and still requires some heavy equipment, such as 'turn-table' ladder, fire engines, etc.

Eight Fire-Instructors, ranking Sergeants, sat for examinations and were successful and promoted to Fire Officer, Grade "A". They were I. S. Doni; M. R. Hartmann, J. Gotlieb, E. Glass, J. Silber, J. Paniz, J. Schneidermann and C. Pupkin.

* * *

Los Angeles Reports Increased Alarms

The Sixty-Sixth Annual Report of the Los Angeles Fire Department, Chief John H. Alderson, reports a total of 25,679 alarms responded to by the fire department in the fiscal year 1951-52. This was an increase of 2,283 over the previous year. There were 1,757 false alarms. The increase is attributed to burning of brush and grass, fires in dwellings, courts, etc., and calls for rescue service.

According to the report, total disbursements for the fiscal year to operate the department were $12,427,665.91. The fire losses are not stated, but there were 35 fires which resulted in losses of over $10,000 each.

The department has a personnel of 2577 uniformed and 116 civilian employees. It occupies 91 locations. The Report includes the complete operational records of individual companies as well

as the numerous divisions of the department, such as Training, Fire Prevention, Photography, Arson, and so on.

* * *

New Haven Losses Up Slightly

According to the Annual Report of the New Haven Fire Department for the year 1952, Chief Paul P. Heinz, fire losses were $583,149.97, an increase of about 9 per cent over 1951. There were 3210 alarms received. The report points out that during the year the prompt action of automatic fire detection devices "saved extensive damage" to numerous occupancies.

The Report contains an inventory and valuation of the entire department. Total expenditures for the year were $1,670,308.63. The department presently has 351 personnel. Chief Heinz reports to this Journal that with the acquisition of three new pumpers all department apparatus will be modernized. The Report pictures and describes the latest developments in the department, including new apparatus and equipment.

* * *

Leicester (Eng.) Fire Brigade Active

Greater activity during the year 1952 is reported by the Leicester, England, Fire Brigade, Errington McKinnell, O.B.E., M.I. Fire E., Chief Officer.

There were 205 more calls received in 1952 than the year previous (mainly due to chimney fires, it is disclosed). It is interesting to note that there were 53 "Malicious False Alarms" over the "Fire Alarm System" and 76 listed as "Exchange Telephone." There were 107 other false alarms listed as "Good Intent," of which 97 were "Exchange Telephone" or "Police Private Wire." There were 24 false alarms due to "Mechanical Defects," of which 9 were street fire alarms, and 15 automatic alarms. There were 89 false alarms due to mechanical trouble listed as "Special Service Emergency" and "Special Services." It is said that there was a drop of 44 per cent in malicious false alarms.

The Report does not give fire losses, but does describe the make-up and operations of the Brigade. Like other British Reports, it is well edited and printed.

* * *

Chief Hydaker, Lima, Ohio, Wants Improvements

Whereas most annual fire reports conclude with recommendations of the Chief, these lead off in Fire Chief Hydaker's Annual Report of the Lima, Ohio Fire Department for the year 1952.

The Chief urges immediate rehabilitation of Fire Station 3—and its eventual replacement with a bungalow-type house. He urges cancellation of out-of-town protection contracts with the Townships of Bath, American, Perry and Shawnee, following the NFBU's criticism of existing agreements. Also he calls for repairs or replacement of No. 4 and No. 5 Stations. Additional personnel is recommended to bring the department to a total of 80.

Further improvements call for a high-pressure fog pumper within two years; radio for Pumpers 1, 3, 4, 5, and 6; an additional 1½-ton pickup truck; a standard sedan for the Fire Prevention Bureau; additional hose, fire hydrants, air demand type masks, handie-talkies, more fire alarm boxes, and miscellaneous fittings and equipment.

Fire losses in 1951 were $152,444. There were 609 alarms, 43 less than the year previous. Box alarms totalled 30, of which 16 were false. The department worked 621 hrs. 12 min., and apparatus traveled 2,735 miles.

* * *

Detroit Alarms and Losses Up!

During 1952, the Detroit Fire Department responded to 18,571 alarms of fire, an increase of 2,326 (14.3%). There were 1,898 false alarms, an increase of 6.5%. Fire Losses were sharply up for the year—a total of $9,294,605, or an increase of $3,579,122, or 62.6%. There were 21 fires during the year with individual losses exceeding $50,000 against 13 such fires the year before.

This increase regrettably came notwithstanding 80,265 inspections and re-inspections by F. P. Division inspectors and 24,815 building inspections by fire company officers—an increase of 2,020 over the previous year. In addition, the Fire Prevention Division under Fire Marshal Edward W. Hall, conducted a strenuous fire prevention campaign in all walks and enterprises.

Smoking, according to the Marshal's Annual Report for 1952, was the main offender as a cause of fatal fires, of which there were 39.

* * *

Wichita "Business" Increases

One of the model annual fire reports received is that of the Wichita, Kans., Fire Department, Chief F. E. Wood. Not only does it cover all necessary statistics of fires, alarms and losses, but it is a running story of the progress of the department.

In the 1952 fire force handled 3,075 alarms compared with 2,843 the year

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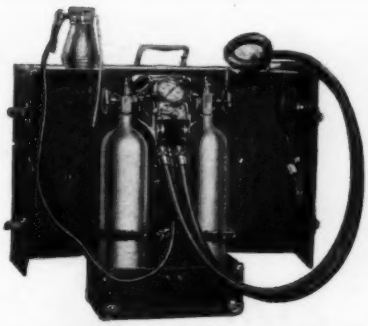

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With them you can give greater protection to your men and your community; make your job easier and more appreciated.

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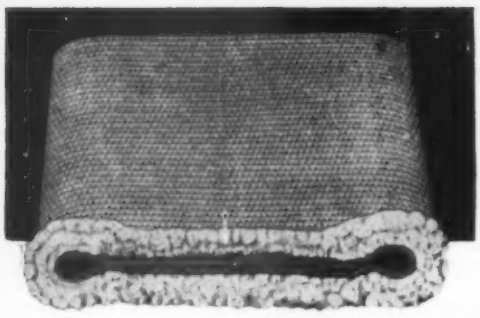

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DEALER TERRITORIES AVAILABLE

EXCLUSIVE manufacturers of cotton rubber lined and unlined linen Fire Hose for Municipal, Industrial and Forestry Service — all top quality — made on modern equipment by experts with years of hose manufacturing experience. We welcome the opportunity to quote on your hose requirements.

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NORTH BERGEN, NEW JERSEY *INGLEWOOD, CALIFORNIA*

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Fire fighting is an exacting occupation. One mistake may be the last.

Likewise, the manufacture of fire fighting trucks is a very exacting business. Every piece of equipment must be dependable to eliminate any chance of mechanical failure.

For many years Attwood has supplied over 90% of the fire equipment manufacturers with standard and special hardware and fittings.

Contact Attwood regarding the manufacture of equipment to your specifications.

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BRASS WORKS
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previous. There were 64 false alarms. Total fire loss was $740,667—an increase of $361,259 over 1951. Matches and smoking are the big offenders as fire causes.

Proposals for 1953 include a new fire station, No. 11, in the southeast section of the city; removal of old Station No. 5 and construction of a new station at 2nd & Hillside; also a new station to replace old Station 3, at 18th & Topeka.

Two new 750 GPM pumpers are contemplated, as well as two 65 ft. aerial ladders and two light passenger cars. Fifteen 115 volt sirens are wanted, to be used in clearing fire lanes. Two FM radios will be added. The department has 9 of its 20 companies radio equipped. Six additional fire fighters are to be employed.

* * *

Everett, Wash., Report Is Good Promotion

Fire Chief F. F. Schroeder of the Everett, Wash., Fire Department employs his Annual Report for 1952 to promote fire prevention, particularly in homes, in which half of the city's fires occur. The report's foreword is an excellent sermon on fire safety. During the year there were 716 alarms with fire losses of $87,935.97.

The report stresses the time saved by the department's use of radio, all trucks being so equipped. During 1952, it states, the companies were in service 64 hours and 28 minutes more because of radio.

* * *

Honolulu Fire Losses Up

According to the Annual Report of the Honolulu, Hawaii, Fire Department, Fire Chief H. A. Smith, fire losses in 1952 were $434,761.97 over the $396,339.38 loss incurred in 1951. Rural losses showed a decrease of $55,779. The report details the numerous civic activities participated in by the department. There were 1433 alarms in 1952 compared with 1219 in 1951.

Chief Smith recommends additional manpower; a new 85-foot aerial ladder; additional engine companies in Kailua and Wahiawa and other locations; creation of more battalion chiefs and additional clerical staff. A number of fire stations require rehabilitation. One need stressed by Chief Smith is a modern drill tower.

* * *

Business Up in Kent County, England

Chief Fire Officer U. H. Fordham of the Kent County Fire Brigade, Tovil, Maidstone, Eng., in his Fifth Annual Report, for the period April 1, 1952-March 31, 1953, tabulates the largest number of fire calls in the 5-year history of the Brigade. A total of 9,649 calls were received of which 7,875 were for fires, 321 malicious false alarms, 673 "good intent" false alarms, 341 aid to neighbors and 439 special services.

The Kent Brigade protects an area of 975,972 acres with population of 1,586,000 and a rateable value of £12,802,045.

Fourteen of the 15 whole-time fire stations are radio equipped, it is disclosed. The Brigade has a total of 14 walkie-talkie sets in use.

* * *

Melbourne Metropolitan Brigade Reports

According to the Report of the Melbourne (Australia) Metropolitan Fire Brigades Board for the year ending June 30, 1952, actual fire calls for the period decreased from 5,740 in the year before to 5,418. False alarms increased,

however, by 40, a total of 5,455 for the period.

Two firemen suffered serious injuries in an unusual accident. While attending a fire in an office of a stone quarry, they were injured by an explosion of detonators kept in safes within the building. A sub-station officer suffered an eye injury, and a fireman lost the sight of one eye, while his other eye and his hearing were affected.

L. P. Whitehead, M. I. Fire E., J. P., is Chief Officer.

The Brigade has 42 stations, a fire fighting staff of 633—all ranks; 76 special service firemen; 18 partially paid personnel, and 178,615 ft. of hose. There are 1,600 street fire alarm boxes.

* * *

Chief Charles Reports

In a 51-page annual report of activities of the Charlotte, N. C., Fire Department for the year 1952, Chief Donald S. Charles reports the highest fire losses in years—$648,068.79, and calls upon the city for improvements in the department.

Chief among these is a new fire station to serve southwest Charlotte, and for better protection in the northwestern section. For the latter he urges an engine company in Station 4 which now has one engine company and a ladder company. Additional men also are sought for the Morris Field Fire Station. The present repair shop at headquarters is inadequate, he reports, and urges a new shop building.

In 1952 the department answered a total of 2,637 alarms of which 342 were listed as mischievous and malicious.

* * *

Spasso House, Moscow, Damaged by Fire

Fire on June 14 damaged the stately dining room at Spasso House, home of U. S. Ambassador Charles E. Bohlen, while Mrs. Mesta, former envoy to Luxembourg, slept one flight above.

The blaze, believed caused by a short-circuited power line just after an electrical storm in Moscow, caused several thousand dollars damage. No one was injured.

The fire broke out on the first floor after Ambassador and Mrs. Bohlen and their guest, Mrs. Mesta, had retired. It was discovered by the Bohlens' nurse and a Chinese servant. The fact that the fire was confined to the one room was credited to the presence of many fire extinguishers in the house.

July Fire Losses

Estimated fire losses in the United States during July amounted to $74,938,000, it was reported by the National Board of Fire Underwriters.

According to Lewis A. Vincent, NBFU's general manager, this $74,938,000 loss represents an increase of 21.5 per cent over losses of $61,675,000 reported for July, 1952, and an increase of 10.8 per cent over losses of $67,644,000 for June (1953).

Losses for the first seven months of 1953 now total $507,019,000, an increase of 8.7 per cent over the first seven months of 1952, when they amounted to $466,328.000.

These estimated losses include an allowance for uninsured and unreported losses.

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APPROVED FIRE EXTINGUISHERS OF ALL TYPES

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Our Very Own Custom Master Built Fire Trucks
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For floodlights, rescue work, power tools

PORTABLE model is widely used by municipal and volunteer fire departments for floodlights, smoke eradicators, resuscitators, power tools, rescue equipment. Develops 1500 watts. Fits in small space. Equipped with 4 receptacles, pilot light, double carrying handle. Rubber-tired hand truck available. Other sizes, 500 watts to 30 KW. Also stand-by models to operate signals, sirens, when central station power is cut off. Write for booklet 9-M.

MODEL 1.5M25, *1500 watts, 115 volt AC. Manual control. Weight 130 lbs. Also 115 volt DC model weighing 101 lbs.*

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AIR-COOLED ENGINES • PRECISION CONTROLS

LEONARD ROTARY GEAR PUMP *a new and better*

FIRE APPARATUS PUMP

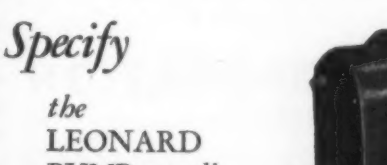
"The Pump You Can't Wear Out"

Whether you are writing specifications for a new truck—or rebuilding an old one—you owe it to yourself to look into the Leonard Pump. It is specifically designed and built for rugged fire service. Delivers 150 GPM at 150 lbs. pressure. Shafts are mounted on Timken Bearings to prevent wear, suction and pressure loss. We'll welcome your request for complete information.

National Distributor

AMERICAN FIRE EQUIPMENT CO., 717 BOYLSTON ST., BOSTON 16, MASS.

Specify the LEONARD PUMP *on all new trucks!*



MODEL 20 SIRENLITE for Emergency Vehicles

Siren sounds a penetrating warning, red light automatically flashes authority. Traffic opens instantly, day or night. FREE ROLLING feature.

STERLING SIRENS

- **HANDSOME**
- **RUGGED**
- **RELIABLE**

Built by proud craftsmen to the highest standards of precision manufacturing . . . utilizing materials of finest quality . . . Sterling Sirens give year-after-year of unsurpassed dependability and satisfaction.

MODEL M GENERAL FIRE ALARM SIREN for Volunteer Systems

Quick acceleration, power-plus . . . Model M really gets the boys out in a hurry! Used by championship companies from coast to coast. A dependable, heavy-duty siren built of the finest materials throughout.

Complete line of Siren Equipment • *Bulletin on Request*

THE STERLING SIREN FIRE ALARM CO., INC.
10 BARTLETT ST., ROCHESTER 8, N. Y.

News of the Manufacturers

(*Continued from page* 811)

Mack Promotes Crockett

Albert G. Crockett, Mack Truck executive, has been appointed Director of the company's newly-formed Sales Development Division. Announcement was made recently by E. G. Ewell, Vice-President and General Sales Manager.

In his new capacity Mr. Crockett will coordinate the functions of Public Relations, Advertising, Sales Promotion and Sales Training.

Albert G. Crockett

Mr. Crockett was formerly Special Assistant to the Executive Vice-President and Manager of Public Relations. He has played a leading part in Mack's public relations campaign in behalf of truckers and the trucking industry. A nationally-known speaker and recognized authority on transportation subjects, Mr. Crockett became particularly well-known for his early wartime "Keep 'Em Rolling" national tours, sponsored by Mack in cooperation with O.D.T. and the late Joseph B. Eastman.

Fire Master Corp. Gets Big Government Order

The Fire Master Corp., of Mt. Clemens, Mich., reports the receipt of an order from the U. S. Government for 236 fire trucks. These units, states the Company, are designed to stand temperatures down to 65 degrees below zero. Incidentally, the company's sales volume for the past year ran nearly a million dollars in fire extinguishers, fire trucks and fire equipment, according to a statement recently made by the corporation.

The officers of the company include A. B. Seigfreid, J. B. Slaughter, Herman Frank and D. D. Siegfried.

Art. Espey Joins Central Safety Equipment Company

Henry Gordon, president, Central Safety Equipment Company, 2200 East Huntingdon St., Philadelphia, Pennsylvania, has announced the addition of Art. Espey to his staff. Aside from handling a complete line of safety equipment, "Central" is the distributor for the fire fighting products of the Rockwood Sprinkler Company, 38 Harlow Street, Worcester, Mass.

Art. Espey, former officer, Elmira, N. Y., fire department, who became the first head of the Pennsylvania state fire school, has had a long and varied experience in the fields of fire fighting and

fire protection and in the training of fire fighters, he is well versed in industrial fire protection engineering. Recognized as a capable public speaker, Art. has regularly appeared before the public and holds honorary memberships in more than 75 fire fighters' organizations. Espey is a member of the International Association of Fire Chiefs, International Association of Fire Fighters, National Fire Protection Association, Philadelphia Chapter, American Society of Safety Engineers, in addition to his many honorary affiliations.

Packo Outfits for U.S.

The Welders Service Company, Pittsburgh 22, Pa., reports that they are now in the process of producing their Packo emergency cutting outfits for the U. S. Navy and for Civilian Defense.

New Arguslite for Ambulances

Fire departments which operate an ambulance usually feel the need of both front and rear protection for it. To fill this need, Arguslite Co., of Blue Ridge Summit, Pa., offers a new light especially designed for ambulances.

The AL light uses the popular 360° fresnel lens. Its bracket fits the side of the car roof, with the ball and socket joint allowing the light to be placed in a vertical position.

The Company states:

"A recent article says that the most effective type of warning light is a pair of lights with an alternating flasher. The use of fresnel lens is particularly desirable. The AL light is designed for use in this way. Ideal for mounting on fire engines and public utility trucks also."

Automatic V. L. Extinguisher

The Standard Safety Products Co., P. O. Box 2111, Lansing 11, Mich., has placed on the market an automatic vaporizing liquid extinguisher, which bears the trade name "Firetox."

Automatic V. L. Extinguisher

It consists of a 3-quart aluminum container (which holds 2 quarts of carbon tetrachloride and 12 ounces of special ammonium hydroxide) and is equipped with a sprinkler head at the top. The liquid will not freeze. After being discharged by fire, Firetox is refillable at the factory under the supervision of Underwriters' Laboratories, Inc.

The extinguisher is fully automatic, operating similarly to a water sprinkler. When the heat from a fire reaches 165

THERE ARE *many* REASONS FOR JANESVILLE SUPERIORITY

The JANESVILLE label in your turn out suit stands for quality, protection, comfort and lasting service . . .

CUSTOM-BUILT . . . fire coats are available in any length wanted. Also sleeve lengths.

WOOL WRISTLETS . . . that prevent water from running down your arms. Reinforced cuffs, roomy sleeves.

DETACHABLE LINING . . . wool or flannel that gives you double protection—longer wear.

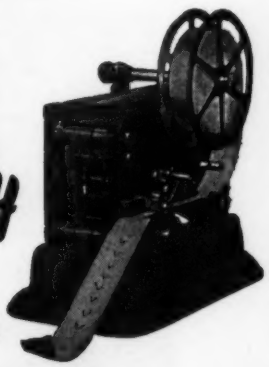
QUICK DEPENDABILITY . . . the Janesville-designed "quick-hitch" snaps and dee rings insure speed when it's most essential.

SCOTCHLITE TRIM . . . fire coats are available trimmed with "SCOTCHLITE," the safety feature that reflects light with dazzling brilliance.

For Nearly 50 Years . . . Highest Standards . . . Guaranteed Quality

Janesville APPAREL CO.
JANESVILLE, WISCONSIN

RECORD ALARMS *Automatically* with the PR-10 Fire Alarm



This Harrington punched tape register *automatically* makes records of fire alarms or other emergency signals.

We will gladly send literature describing the *Harrington* PR-10 as well as literature describing fire alarm boxes, positive non-interfering successive, street boxes, auxiliary station boxes, gongs, etc.

HARRINGTON SIGNAL COMPANY
MOLINE ILLINOIS

When you need Shut-Off Nozzles—DEMAND the—

COLT

The Shut-Off Nozzle With the Reputation

OUR more than Forty Years' Experience in Manufacturing Nozzles cannot be denied, and backed by a Five-Year Guarantee on each Nozzle, you Obtain only the Best when you get a *COLT*.

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Playpipes, Siamese—Plain or with Shut-Offs, Hydrant Gate Valves, 1", 1½", 2½" Quarter-Turn Shut-Off Single Valves, Water Thiefs. All types Brass Hose Connections.

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Our Facilities for Making Up Your Special Items Are Unexcelled.

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Your Jobber or Dealer Can Supply You with Guaranteed Colt Shut-Off Nozzles and Allied Brass Products.

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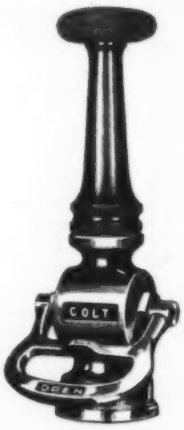

Make Your Truck a Completed Fire Weapon with **COLT** Fire Protection Equipment

41 Years in Fire Protection

EXCELSIOR BRASS MFG. CO.

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PORTER FIREMAN'S CUTTER

An insulated fireman's cutter recognized as standard equipment by practically every fire department and rescue squad in the country.

Fast, safe, powerful on "hot" or "cold" lines. Search hook locates wire in the smoke and darkness — automatically guides it into the cutting jaws. Cohardite insulation molded onto the handles . . . individually tested at the factory to 20,000 volts. Made in three sizes. Write for catalog illustrating cutters for bars, case-hardened padlocks, wire grilles, etc.

H. K. PORTER, INC.

SOMERVILLE 43, MASS.

degrees F., the solder fuse melts, releasing the nozzle cap, while the ammonium hydroxide develops pressure within the extinguisher. The pressure forces the carbon tetrachloride against the spreader which atomizes it into the air where it is transformed by heat into a heavy gas which settles over the fire.

Each unit protects 10 x 12 feet of confined area.

Walker Heads New Motorola Region

Eugene S. Goebel, national sales and service manager of Motorola Communications and Electronics, Inc., recently announced the promotion of Frank W. Walker to the position of regional sales manager. The newly created sales region which Walker will head is composed of Southern California, Arizona and Southeastern Nevada. Offices will be in Los Angeles.

He will direct the sales and service of fixed, mobile and portable two-way radio, microwave, power line carrier and supervisory control systems.

New Issue "Fire Station Design" Available

The Circul-Air Corporation, Detroit, announces Volume 4 of its biennial publication, *Fire Station Design*, is now ready for distribution. This fourth edition is the largest and finest in their series of reference books for chiefs, city officials, architects, architectural students and others interested in housing facilities for the fire service.

The new book is a 60-page brochure depicting plans and perspective drawings of about 70 of the newest and best stations in the United States and Canada, with editorials by high ranking technicians, architects and the National Board of Fire Underwriters.

The book will be sent gratis to all who request it as have some 11,000 copies of the earlier editions. Plans shown in the new issue include stations from such cities as Cleveland, Toledo, Los Angeles, Detroit, Memphis, Seattle, Milwaukee, Boston, Raleigh, Charleston, Kalamazoo, Monroe (La.), Atlanta, Wichita, Topeka, Austin (Texas), and scores of smaller cities and suburban communities on Long Island, in California, Florida, Illinois and others in most metropolitan areas.

Readers may obtain a free copy of Fire Station Design, by sending their request to the publishers, The Circul-Air Corporation, 575 East Milwaukee Avenue, Detroit 2, Michigan.

In addition to the chiefs, city officials and architects who use this book as the only reference material relating to fire structures, over 50 colleges and universities maintain it in their files for student reference; it is also on file in public libraries in over 150 cities throughout the world.

(The station depicted on the front cover, reproduced herein, is the new fire headquarters for the city of Toledo, Ohio, one of the most dramatic portrayals of contemporary architecture we have seen to date.)

New Recording Device for Fire Alarms

A new device, which for the first time permits 24 hour automatic sound recording, was announced Aug. 13 by Walter Niles, president of SoundScriber Corporation, New Haven, Conn., manufacturer of dictation equipment.

Walter Niles, president of Soundscriber Corporation, New Haven, Conn., records a message on company's revolutionary new magnetic tape recorder-reproducer, now being manufactured for civilian use, such as recording telephoned fire alarms, etc. Machine delivers 24 and 48 hours of continuous, unattended recording on one roll of tape, on two channels of communication simultaneously.

Production is now under way for civilian use of the revolutionary equipment. The device is capable of delivering 24 and 48 hours of continuous, unattended high-quality magnetic recording on either one or two channels of communication simultaneously, on a single reel of tape.

The magnetic tape recorder-reproducer, as it is called, was perfected after several years of joint research and development by the U. S. Navy Bureau of Ships and engineers of SoundScriber Corporation.

More than 500 of the recorders, Niles revealed, have been in use during the past year at Naval air stations throughout the world, where they are being used to make accurate records of ground-to-air, air-to-ground communications. Production of the equipment for commercial use, he said, now has been started in New Haven.

The equipment is able to record the exact time messages are received, by means of a printed time-scale on the three-inch-wide tape. The tape also measures elapsed time between recordings and allows fast place-finding, without an audible search.

Rigid safety controls, Niles said, are built in the recorder. A buzzer sounds if a power failure occurs, or when the machine nears the end of the tape, or if

FIREFLY

THE SIGN THAT STAYS REFLECTIVE

ALUMINUM PLATE, SCOTCHLITED

READABLE-DURABLE-TROUBLE FREE

DAY OR NIGHT

FIRE RED LETTERS

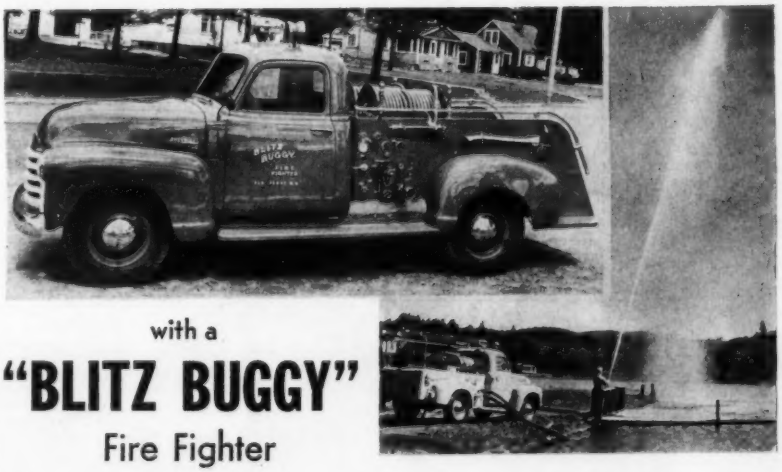
Being identified is the surest, safest way to reach a fire. Firefly is your best identification.

see your dealer or write

PACIFIC REFLEX SIGNS

BOX 323 McMINNVILLE, OREGON

MODERNIZE YOUR FIRE DEPARTMENT!



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"BLITZ BUGGY"

Fire Fighter

2-Stage Centrifugal Pump
300 GPM at 100 lbs. Pressure
Carries its own Water Supply

100 Gal. at 600 lbs. Pressure
Your choice of Chassis
Fog Foam and Wetting Proportioner optional

Write for Specifications:

THE BLITZ BUGGY COMPANY
(successors to Hi-Pressure Fog Equipment Co.)

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NEW YORK

COMPARE!

WENTWORTH

"HEAD-MASTER"

- QUALITY
- COMFORT
- SERVICE
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when ordering from your local uniform or fire equipment dealer

Write today for our illustrated Fire-Fighters uniform cap circular

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Firemens

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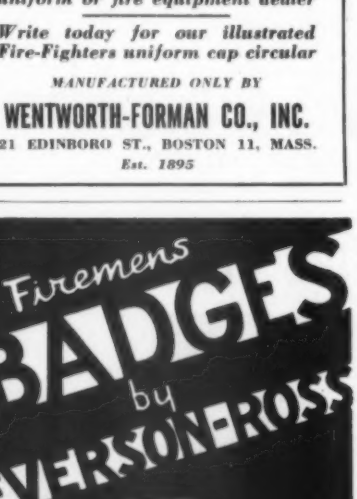

Write for folder

EVERSON-ROSS

55 CHAMBERS ST. NEW YORK 7, N. Y.

the tape breaks. The instrument plays back recordings instantly, when a playback switch is thrown.

Its commercial applications, which have been tested during the past year include police broadcast copying, fire alarm recording, etc.

Wm. B. Moore Joins Universal

Wm. B. Moore, who for the past 12 years has been Divisional Fire Apparatus Manager for the Mack Motor Truck Corporation with headquarters in Chicago, reached the company's retirement age on March 1st of this year. Since leaving that organization, he has purchased an interest in the Universal Fire Apparatus Corp., and is continuing in his active sales of fire apparatus for the latter.

Mr. Moore, better known as "Bill," is a familiar figure at the International Association of Fire Chiefs conventions, and his many friends will be glad to see him continue in the sale of fire apparatus rather than enter into retirement.

Canadian Government Buys 40 Pumpers for Civil Defense Training

The Government of the Dominion of Canada recently purchased 40 pumpers from Bickle-Seagrave Ltd., Woodstock, Ont., for Civil Defense training.

Units are closed-cab type to accommodate 6 men; Chevrolet chassis; to deliver 500 GPM (Imperial) at 120 lbs.; 350 GPM booster tank; hose body to accommodate 1,200 ft. of 2½-in. and 400 ft. of 1½-in hose. Accessories include 24 ft. and 14 ft. ladders; 150 ft. booster line; nozzle holders; fog nozzle; portable pump (200 gal. capacity); floodlights; radio compartment; fittings, etc.

At a spring meeting, the Civil Defense authorities from the Dominion Government and Province of Ontario attended tests of the first seven pumpers held at the Woodstock plant. Present were Civil Defense Coordinator for the Dominion of Canada, Major General F. F. Worthington and his assistants Col. P. Cawdon and Brigadier Jefferson. From the Ontario Government, Hon. Arthur Welsh, Provincial Secretary and Civil Defense Coordinator; Fire Marshal William J. Scott and twelve of his deputies. Also present were many Ontario Fire Chiefs.

After the delivery ceremonies, the units were demonstrated, first pumping from draft, and then with oil pit fires. The Ontario Fire Marshal's Office, in conjunction with 20 firemen from the cities of London, Brantford and Woodstock, conducted the pumping demonstrations.

The first ten units for Ontario participated in the recent Civil Defense exercises at Niagara Falls, Ont., and New York after which they were delivered to their assigned cities.

Akron Brass to Show New Products

Two new products to be exhibited at the Toronto Conference of the I.A.F.C. by the Akron Brass Mfg. Co. Inc., of Wooster, Ohio, will be their Forgex coupling and the Autostream nozzle.

New Autostream nozzle (left), and new forged brass coupling (right).

The Forgex coupling is a new light weight coupling for fire hose. The manufacturer says: "Since it's only half the weight of a cast coupling it makes hose handling easier and faster. The forging process of manufacture directs and controls the concentration of grain structure in the coupling at points of greatest shock and stress to obtain the utmost strength and toughness."

Of their new nozzle, the company states: The Autostream nozzle enables the fire fighter to obtain any stream instantly without twisting or turning, whether straight stream, 30° or 60°. With finger-tip control of the lever, the operator delivers the exact stream desired in less than one second. Streams

Seven of 40 C.D. training pumpers ordered from Bickle-Seagrave by the Dominion of Canada are shown being tested at the Woodstock plant before Government, Provincial and local authorities.

can be selected as easily in darkness as in daylight and, once selected, the positive positioning feature keeps the nozzle in place even if dropped or bumped." Other features of Autostream nozzles include a breakproof handle, shockproof bumper and all brass body. The unit is self-lubricating and works easily under all weather conditions.

New Foam-Maker Pump

A new technique in foam fire fighting is being offered commercially by Cardox Corporation, Chicago, Illinois, in their development of the Foam-maker pump. Although these units have previously been used in England, their use here has been for test or experimentation.

Cardox Foam-Maker Pump

Foam pumps and their application have been under study and test by the U. S. Navy for several years. The new Cardox Foam-maker pump after extensive qualification tests and has been accepted by the Navy for their new foam crash trucks.

These pumps have a deluge capacity of 3,000 gallon of foam per minute and offer possibilities in quick application and extinguishment in large fire problems. Pumps of smaller capacity are also available.

The foam is produced in the pump and its characteristics prove it efficient in its "blanketing" effect on fires. Other features of the pump are that expansions can be varied from 12 to 1 to 4 to 1, "and good foam can be obtained with as low as 4 percent of protein-base foaming agents," according to the manufacturer.

N. C. Firemen Re-elect Officers

C. L. Burkett, of Salisbury, N. C., was re-elected president of the North Carolina State Firemen's Association at the annual convention of the body held at Carolina Beach on the first day of the sessions, Aug. 18th.

Besides Burkett, those continuing in office for another year are: Vice-president C. L. Morris of Albemarle; secretary I. Miller Warren of Plymouth, and treasurer Ralph E. Mabry of Badin, N. C.

D. G. SPENCER.

GET TO THEM IN A HURRY!

SAVE TIME LIFE AND PROPERTY!

ARGOSY'S RECENT STORY ABOUT LADDER 26, BUSIEST N.Y.C. TRUCK:

"The most useful tool is the 'Halligan Tool'—About 30" long, it is an UGLY BAR of forged steel with crow-bar teeth at one end and a 3-sided combination hook, axe and sledge at the other end. It is used to rip open skylights, bulkhead doors, punch holes in roofs, knock down cornices, pry open doors and flooring. The thing we all like about it, says fireman Sisty, "is that it weighs only 8 pounds, can be used in a tight place and can do anything". When life is in danger—only the best is good enough!

Read what happened in BOSTON—

Boston Protective Dept., March 14, 1953—fire at 100 Chauncy St.—7 sprinklers on top floor operated—*This company opened 28 doors with this tool.* THEY PUT BACK INTO IMMEDIATE USE—WITH LITTLE OR NO DAMAGE—26 OF THOSE DOORS!

SEND FOR THIS TOOL NOW—PUT IT TO USE—AND YOU'LL SEE WHY FIREMEN EVERYWHERE SAY IT'S THE BEST TOOL YOU CAN BUY—ORDER ONE.

$36.00 F.O.B. U.S.A.

Write—**M. A. HALLIGAN** 1505 Metropolitan Ave., New York 62

1001 USES—DOES EVERYTHING—EVERYWHERE

THE HALLIGAN TOOL

With best wishes for the biggest and best I.A.F.C. convention ever.

We are proud to be members of the INTERNATIONAL ASSOCIATION OF FIRE CHIEFS. We are also proud of the contribution our MEMCO AERIAL LADDER has made to the Fire Service by making available an aerial to all cities, both large and small. About half of our production goes to fire truck manufacturers who build them on reasonably priced fire trucks. The rest of our sales are to Fire Departments who install them on existing trucks.

The new improved model MEMCO AERIAL LADDER is an economical all-metal ladder unit designed to be installed on an existing truck or to be installed on new equipment by your fire truck manufacturer. Electrically raised and lowered by power from the truck battery. The ladder sections are very compact for short wheelbase trucks and all sections have tubular steel hand rails. Safety belt loops are provided for use when operating a ladder pipe.

FOR DETAILS WRITE, WIRE OR PHONE

MEMCO AERIAL LADDER CO. JAckson 5-6603

1007 N.W. 36th STREET OKLAHOMA CITY 3, OKLA.

our 50th year

STANLEY H. REESE BADGES 57 WARREN ST. N.Y.

FIRE BADGES

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50 Years of Experience Is Your Guarantee of Satisfaction.

CATALOGUE No. 83FE IS OUR CURRENT ISSUE.

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BRONZE TABLETS *for*

HONOR ROLLS
MEMORIALS • AWARDS • TESTIMONIALS
COMMEMORATIVE PLAQUES

Every fire department . . . every fire house . . . should keep on hand this big 48-page catalog, illustrating 150 suggestions for handsome, imperishable, solid bronze tablets. Sent free—ask for Catalog FE1.

TROPHIES and MEDALS, TOO!

Special catalog illustrates 900 cups, trophies, medals, etc. suitable for presentation as prizes and awards in all kind: of contests, or for testimonial purposes. Sent free — ask for Catalog FE2.

INTERNATIONAL BRONZE TABLET CO., INC. 150 WEST 22nd ST. NEW YORK 11 N. Y.

Ed. Lamb Dead

As this issue of FIRE ENGINEERING goes to press, word comes of the passing on August 21, of Captain Ed Lamb for many years Sergeant-at-Arms of the International Association of Fire Chiefs' Conference. Captain Lamb, who was a captain in the American Army during the Spanish-American War, was a prominent figure in the fire service for half a century.

Ed. Lamb

He was master mechanic of the San Francisco Fire Department at one time, and, following his retirement, became Chief of the Leland Stanford University Fire Department.

In later years he devoted his efforts to development of fire department appliances, the best known of which is the Lamb Air Mover.

He held memberships in the I.A.F.C., the Pacific Coast-Intermountain Association of Fire Chiefs, the David Scannel Club of San Francisco, Veterans of Foreign Wars, American Legion, and countless other fire service associations.

Linwood A. Miller Dead

Linwood A. Miller, 68, president of Federal Enterprises, Inc., 8700 State st., Chicago, Ill., died August 3 in Englewood hospital. Mr. Miller's home was in

L. A. Miller

Toledo, O., and he commuted to Chicago, residing in the Union League club on business trips to the latter city.

He was born in Salem, N. J., and for several years was president of Willys-

The Fireman's Choice

Powerful Light
When he needs it—where he needs it
Big Beam
PORTABLE ELECTRIC HAND LAMPS

Model 700
2000-foot beam
Most powerful, heavy-duty hand lamp of its size. Adjustable 6-inch head. Operates on four standard No. 6 dry cells.

Model 211
1500-foot beam
Popular price, light weight, easy to carry. Adjustable 5-inch head. Operated on two standard lantern batteries.

Write for folder on complete information on these and other Big Beam dry-cell and storage-battery models.

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BUNKER SUITS
FOR COMFORT & PROTECTION

WE ARE DISTRIBUTORS FOR
SIREN BOOTS
We have been supplying **FIREMEN'S CLOTHING** for over 25 years.
Any fireman can have a catalog by writing—

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ST. JOSEPH - - MISSOURI

CHIMFEX
THE CHIMNEY FIRE EXTINGUISHER

PUT OUT
CHIMNEY FIRES
SAFELY FROM INSIDE

Chimfex puts out chimney fires quickly, easily and without risk of life or property. Eliminates the hazard of working from the roof and damage from use of water or chemicals.

Simply scratch the tip, place at base of chimney and the fire is quickly extinguished with smothering gases.

Simple — Safe — Efficient. Don't be without them!

Box of four Chimfex..... $6.60

Order from your dealer or write:

SIGNAL FLARE DIVISION
Standard Railway Fusee Corp.
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Needham Heights 94, Mass.

PORTAPAGE
THE ELECTRIC MEGAPHONE

COMPLETE WITH BATTERIES, $87.50

READY FOR INSTANT USE AT ALL TIMES!

Now you can issue orders or directions clearly and distinctly.

EFFECTIVE RANGE UP TO ¼ MILE!

Long-Life Battery Driven Portable Loudspeaker. No Tubes or A.C. Plug-in.

COMPACT AND EASY TO CARRY!

SOUND-CRAFT SYSTEMS
R3-161 ROCHESTER RD.
PITTSBURGH 2, PENNA.

Overland company. He resigned this position in 1935. He was deputy regional director of the war production board in Chicago in 1942 and 1943. In 1944 and 1945 he was chairman of the price adjustment board, army air service, in Chicago. He leaves his widow, Helen, and three sons, Linwood Jr., Edward, and Richard. Services will be held in Toledo.

Final Honors Paid Chief Jacobs

More than 400 persons, most of them from the fire service, paid final tribute to Chief Clifford E. Jacobs of Wakefield, Mass., who died suddenly of a heart attack, July 25th. The chief was stricken at home following his return from answering a box alarm. Although fellow firemen worked over him with an inhalator he, died later at Melrose Hospital.

Chief Jacobs was widely known throughout New England. He was recently elected second vice-president of the Massachusetts Fire Chiefs' Club. He was also a member of the New England Association of Fire Chiefs, and was a past president of the Wakefield Firemen's Relief Association.

On June 1, 1912, Chief Jacobs was appointed a substitute fireman; three years later he was made permanent fireman. In 1924 he was elevated to the rank of captain and his appointment as chief became effective Oct. 20, 1945, when he succeeded Frederick D. Graham who retired.

Questions and Answers

(*Continued from page* 846)

"True and False" Statements

To the Editor:

The following questions are to be answered "True" or "False."

1. A rolling loop is used to secure hose to a ladder or window sill.
2. Conductivity is related only to electricity.
3. Hose should be carried at couplings.
4. When the nozzle pressure is doubled, the reach of the stream is also doubled.
5. Flame temperatures in fires sometimes range as high as 6,000 degrees F.
6. The ignition temperature of most ordinary combustible materials is between 1,000 and 2,000 degrees F.
7. A "V-1-2-3" extinguisher is a universal extinguisher and is equally effective on Class A, B and C fires.
8. The protection secured by fire doors cannot be better than the retardant of the walls in which they are placed.
9. The recommended method of forcing a tempered glass door is to drive the lock out.
10. The best way to open a double door which is locked from within with a bar is to use a battering ram and strike the door low.
11. The principal purpose of a

INDIVIDUAL IDENTIFICATION PLATES

Firemen and Civilian Defense Fire Departments, made especially for outdoor use, white base plastic, lettering FIRE ENGINE RED.

Wording under FIRE DEPARTMENT: CHIEF, ASSISTANT CHIEF, CAPTAIN, LIEUTENANT, MEMBER, VOLUNTEER, ENGINEER, DRIVER, POLICE & AUX. MEMBER. 63¢ Single, two for $1.25.

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churn valve is to keep water moving the plunger valve.

12. When working from draft and the vertical lift is increased, the capacity of a pump is decreased.

13. Special foams made for use on fires in alcohol and flammable liquids more volatile than gasoline will not extinguish oil fires.

14. The fire flow required for residential areas where no congestion exists and buildings are not high should be enough to supply two fire streams an approximately 500 GPM.

15. Over 1,000,000 deaths are caused by fire each year in the United States.

16. Fires are the number two accident hazard in the country.

17. There are more people burned or injured by fire than there are those who are burned to death.

18. Heat is conducted to a solid wall where it is stopped.

19. A church raise is a high raise requiring eight men to perform the operation.

20. One small opening in a roof is better than several small ones.

21. When inspecting a jewelry store, also insist upon a guide.

22. Carbon monoxide gas is heated to its ignition point in buildings where fire is burning with incomplete combustion.

23. Several lines played on a building is called a water curtain.

24. Flash point of gasoline is zero degrees.

25. To test the priming pump for drafting water of a centrifugal pump, place a cap on the suction hose and operate pumper as when drafting water.

26. A centrifugal pump can pull a vacuum on a hydrant.

27. Most fires need oxygen to burn but may burn in the presence of chlorine gas.

28. The capacity of a carbon dioxide extinguisher is ascertained by weighing.

29. Alco-foam can be used on petroleum oil fires as well as on alcohol and acetone fires.

30. Large fire resistant walls, preferably without windows and doors and large open spaces between buildings offer the best fire protection.

31. Stress on an aerial ladder when a ladder pipe is used is opposite to that when the end of the ladder is resting upon a building.

32. The hotter the water, the more difficult it is to draft.

33. Anthracite coal is subject to spontaneous combustion.

34. Carbon tetrachloride fires are extinguished with carbon dioxide.

(*Continued on page* 888)

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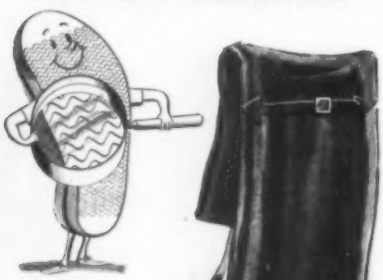

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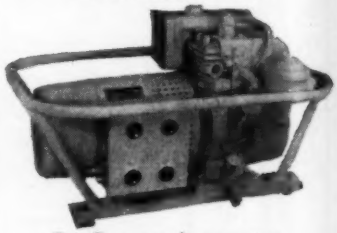

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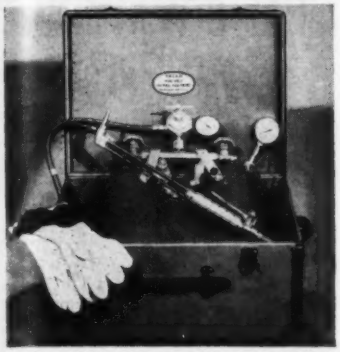

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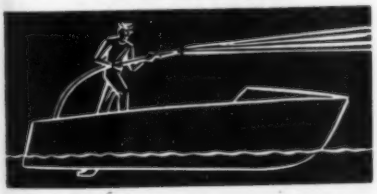

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For further details and specifications write to—

KERMATH MFG. CO.
5885 Commonwealth Ave., Detroit 8, Mich.
A subsidiary of Barium Steel Corp.

Montreal Fire

(*Continued from page 769*)

but the seething mass of flames and dense smoke was unaffected as it fed upon the large store of oils and grease. The inside forces were then withdrawn —just in time to set up a water curtain over the million gallon fuel oil tank now being exposed by flames bursting from the upper floor windows of the reinforced concrete grease plant, the south or rear half of which was apparently fully involved.

At this point firefighters' efforts were largely restricted to exposure protection on the north, east and west, the activities on the north consisting of a delaying action against the flames which were working steadily against the wind toward the front of the structure, while flaring skyward from the south end. The wood framed lube plant was soon in near collapse and the fire losing its intensity, due in large part to lack of further fuel.

Such was the stage of the fire at about 9:40 p.m. when, without preliminary warning, about two-thirds of the big reinforced concrete grease plant collapsed with a roar and a belch of flame which lit up the surrounding area. There was no explosion and the walls were pulled inward by the falling floors as they crashed to the basement. Fortunately the building had been evacuated by this time and the only casualty was one man who suffered burns from the flash of flame which was forced out the front windows into which he was operating a ladder pipe.

This marked the turning point in the battle, the firefighters closing in again as the fire spent itself. The last companies did not finally leave the scene, however, until they had been working for more than three and a half days.

The following is a summary of fire department operations from the statistical side taken from headquarters records through courtesy of Director Pare:

6:18 p.m. — Telephone alarm. Response: two service ladder, three pumper and one salvage companies.

6:19 p.m. — Private box of D.E.P. system from Canadian Oil Companies.

6:22 p.m.—Street box pulled outside plant.

6:29 p.m.—Second alarm. Response: two aerial, two service ladder, three pumper, four hose, two salvage and one rescue squad companies, as well as ambulances, a fuel wagon and major staff officers.

6:45 p.m. — Special call. Response: four pumper and two hose companies.

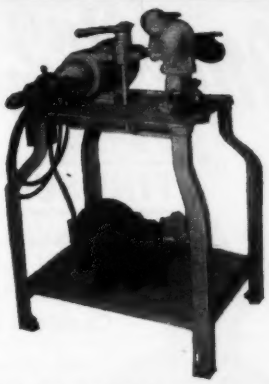
7:28 p.m.—Special call for a second Magirus aerial.

7:53 p.m.—Special call for two pumpers.

8:02 p.m.—Special call for two hosewagons.

Thirteen heavy streams and three hand-lines were in use, requiring 25,900 feet of hose. Two relay pumping operations were set up. All streams were supplied by pumpers and several large calibre fog nozzles were used. Also in service at the fire was a special pumper company from the nearby Imperial Oil Company refinery. No foam was used on the fire.

Although the cause of the fire was not definitely established, evidence brought out at the municipal Fire Commission-



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er's Court indicates a likelihood that it originated in the laboratory where continuous experiments were in progress. These involved electrically heated aging tests on lubricating products. First witnesses of the fire noted the laboratory section to be most heavily involved.

The complete damage caused by the fire included the destruction of the brick, tile and wood structure in which it originated, but in contrast to the ruins of the grease plant, many of the big timber posts which supported the roof and a part of the mill deck of the second floor remained standing in spite of the fact that the fire was of greatest duration here. The various fire doors stood up well, but those adjacent to the blending tank area eventually failed although remaining standing in place.

The wrecking of the reinforced concrete grease plant resulted from several minor failures at the south end, and in the one great collapse, which occurred within two hours of the fire's first getting hold in the structure. This final failure carried roof and all three floors down into the basement in all except a short section on the north end in which the advance of the fire was finally stopped.

Interesting evidence was to be found in the wreckage. There was, for instance, the survival of numbers of the heavy, plastered timber posts and beams in the lubrication plant and the tenacity of the mill floor as contrasted to the light board roof.

Significant was the apparent evidence that the weak link in the reinforced concrete grease plant proved to be the point of support of the floors on the columns. In large areas, the floors were supported directly by the columns without crossbeams or joists. In these cases, the columns had a cap or capital consisting of a rectangular slab of concrete about five feet square and six inches thick upon which the floor rested, apparently common in current construction. In sections of the building where heat was intense, spalling and failure of concrete was most severe in these caps, which appeared to have no reinforcing steel within them. Columns and floors, although severely spalled in some cases, stood up well by comparison. Numbers of columns stood erect when the floors came down, punching through the floors which lay impaled at their feet.

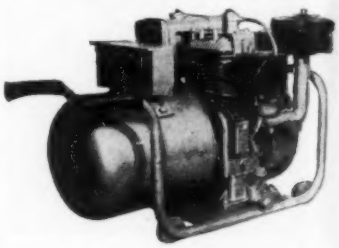
Heavy disintegration of the concrete tended to stop when it reached the reinforcing steel without causing structural failure, and unreinforced pieces, such as the column capitals, disappeared entirely in some cases, causing severe erosion around the bond between floor and column. This latter condition may well have been instrumental in causing the major and early collapse.

Conclusion to Be Drawn

A most important lesson to be relearned from this fire is the obvious need for adequate protection from exposures, fire resistive construction in itself not being a guarantee of safety for a structure or its contents. Also emphasized was the fact that the relationship between construction and design of a structure on the one hand and the intensity of fire-load in its contents on the other is the only real measure of fire resistance.

In this case, approved firedoors, wired-

NEW . . . 2000 WATT
FIRE DEPARTMENT
ELECTRIC PLANT



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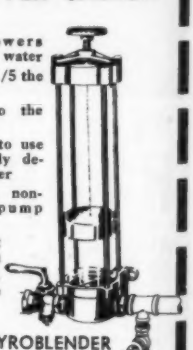

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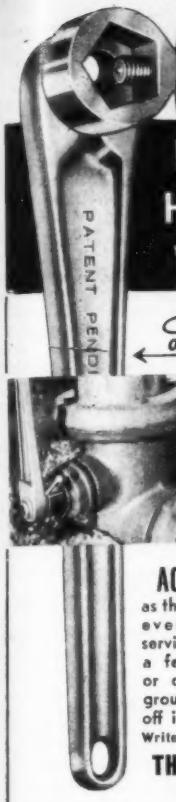

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WHEAT Batteries make the difference. If you value a good light and have never tried this one, write to us now.

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HOWLAND PLACE
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glass windows and the mere fact of reinforced concrete construction were not proof against such a concentration of fuel of very high heat energy content. Even higher standards of protection and a smaller subdivision of fire areas would appear necessary for buildings of "high B.T.U." content occupancies if total losses are to be avoided and the fire department given a fair chance at extinguishment.

The value of private fire protection systems, such as automatic sprinkler systems, is somewhat problematical in an instance such as this, but it is of interest to consider the possibility that automatic sprinklers might have held the fire in check at its point of origin long enough for firemen to concentrate against it. As it was, the few wheeled extinguishers on hand were useless at the time the fire was discovered.

Fresno Fires

(*Continued from Page 771*)

talkies, heavy appliances, etc. Every chief in a metropolitan area should check his supply of this type of equipment.

The City of Fresno has a contract with a private ambulance company. They were notified of the situation and responded immediately and were able to remove firemen as rapidly as it became necessary. Also the city physician, with a staff of 3 doctors, was at the scene all afternoon.

Puerto Rico

(*Continued from Page 774*)

tion over the past 10 years has amounted to 25.9%, which means that Puerto Ricans are paying $1,020,000 a year less than they would have had to pay under 1945 rates.

We visited Puerto Rico last year. We saw the great improvement in the fire-fighting facilities. We saw the firemen going through their drills in the morning and, during the rest of the day, working as masons, carpenters, plumbers, painters, and electricians, in constructing new fire stations. And the firemen are proud of their new stations because they were built with their own hands; enthusiasm was mixed with the concrete that went into the buildings. We also saw mechanics, welders and everybody that could help, working in the repair shop on fire trucks. And when we talked about all this and congratulated Chief Gándara on his amazing accomplishment in developing a highly efficient fire service for the entire island, he just answered with his Spanish accent:—"Well, you know it gives great pleasure to do things for others. We try to do as many as we can just so we can have more pleasure." And he really meant it.

New York Wants Five New Houses

Requests for appropriations for five new firehouses were made August 19 at a budget hearing of the City Planning Commission New York City.

Fire Commissioner Jacob Grumet also asked for money for a combination Manhattan headquarters and firestation. Plans call for housing 14 department bureaus and divisions in the new headquarters.

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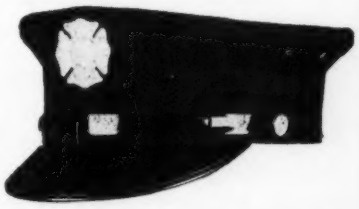

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Your cap is the most distinctive part of your uniform, be sure to specify the best.
Ask your dealer to supply BRUNSSEN'S Helmet Brand Firemen Caps or write to us direct.

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Manufacturers of Uniform Headwear for Hard Wear
106 BLEECKER ST., NEW YORK 12, N. Y.
Est. 1852

Brunssen Caps

Questions and Answers

(*Continued from page 884*)

35. Some fires in substances miscible with water, such as alcohol, can be extinguished with water.

36. A running noose is a bowline knot.

J. M.

Answer 1. A rolling hitch (we assume a "rolling loop" is your name for the same knot) prevents the rope from slipping back and forward around the object to which it is fastened. It is commonly used for securing a hose line to a ladder or window sill. If, by rolling loop, you mean rolling hitch, the question should be answered "True."

Answer 2. False. Conductivity is related to heat also, such as the conduction of heat through a material.

Answer 3. The meaning of this statement is not clear. Hose is not normally carried by the couplings; when carrying hose, it is usually carried across the shoulder or held in the hands. This should be answered "False."

Answer 4. False.

Answer 5. False. While an electric arc will give a temperature of 6,000 degrees, burning materials rarely create a temperature above 3,000 degrees.

Answer 6. False. Wood, paper, pyroxylin plastic, cotton have ignition points below 500 degrees F. (with the exception of white pine, which has an ignition point of 514 degrees F.).

Answer 7. By a V-1-2-3 extinguisher, we presume you mean a vaporizing extinguisher intended for Classes I, II and III fires. Such an extinguisher is not equally effective on all fires, and the answer should be "False." These extinguishers are fully effective on Class B and C fires, but not as effective on Class A fires which are relatively deep-seated. They are, however, effective in extinguishing superficial fires of small size on Class A materials.

Answer 8. The meaning of this statement is not clear. If it means "the protection provided by fire doors need not be better than the retardant effects of the walls in which they are placed," then the statement would be "True."

Answer 9. False. The lock is integral with the glass, and cannot be driven out without shattering the glass.

Answer 10. False. Such doors may be sprung with claw tool, lock breaker or other appliance, and the bar raised, or otherwise removed. Sometimes, as with Fox locks, it is necessary to use several door-forcing tools to spring the door sufficiently that the ends of the Fox lock bar will slip from their sockets.

Answer 11. The purpose of a churn valve is to permit water from the discharge side of the pump to return to the intake side. False.

Answer 12. True.

Answer 13. False. Foams made spe-

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1½" couplings attached ...$ 4.50 set
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Mechanical Foam playpipes (Leading Manufacturer) w/adapter (Cost $50.00 each) .....$8.50 ea.
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Sales representatives by established fire apparatus manufacturer for states south of New Jersey, New England and mid-western territories. Write Box 75, c/o FIRE ENGINEERING, 24 West 40th Street, New York 18, N. Y.

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American-LaFrance FORD 500-gallon rotary gear pumper complete, excellent condition. Contact—Chief Harold Jamieson, Wellsburg, N. Y. Phone—Elmira, N. Y., 7811.

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1924 AMERICAN LaFRANCE LADDER TRUCK equipped with a 600 GPM Pump and 200 feet of Wood Ground Ladders. Available for inspection and immediate delivery.

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cifically for alcohol, acetone and other flammable liquid fires, are equally effective in the extinguishment of oil fires.

Answer 14. True.

Answer 15. False. It is estimated that there are about 11,000 deaths a year in the United States due to fire.

Answer 16. This is a matter of opinion. We are inclined to believe the statement "False."

Answer 17. True.

Answer 18. False. Heat is conducted by any solid material, whether it be the materials of a wall, metals, etc. If heat is conducted to a solid wall, some of it will continue on through the wall.

Answer 19. True.

Answer 20.. The meaning of this question is not clear. For what are the openings cut? If for ventilation, then several factors must be considered. Is the opening for ventilating an attic, or cockloft? Are there several vertical shafts rising in the building, over which openings must be cut?

In general, if for the purpose of ventilating, more than one opening would be desirable for complete ventilation.

Answer 21. While this matter is usually covered in local rules and regulations, as a general policy it is best to have someone with authority in the establishment accompany the inspector on his tour. This will avoid any subsequent, unwarranted claims of pilfered valuables.

Answer 22. True, with reservations. At the point of generation of carbon monoxide, through incomplete combustion of carbonaceous materials, the gas will have a temperature equal to or above its ignition point. But if the gas travels through the building, its temperature is lowered, and at some remote point may be not much warmer than air in other parts of the building not charged with carbon monoxide.

Answer 23. False. To make a water curtain, the line should be so placed as to cover exposures. The statement does not indicate that lines are so grouped, and they may therefore be on different sides of a building. With such deployment, they would certainly not constitute a water curtain.

Answer 24. False. The flash point of gasoline ranges from Zero to minus 50 degrees F.

Answer 25. True. The specifications for motor fire apparatus approved by the International Association of Fire Chiefs includes the following provisions:

"A vacuum test with a capped suction at least 20 feet long shall develop 22 inches of vacuum and hold the vacuum with a drop not in excess of 1 inch per minute."

Answer 26. True, once it is in operation and charged with water.

Answer 27. Here again the statement is not clear. Practically all fires will burn in the presence of chlorine gas, if sufficient oxygen is on hand. On the other hand, in the presence of chlorine gas alone (no oxygen being present) there are but remote cases of combustion taking place. Chlorine is non-combustible, although if combined with hydrogen, acetylene and certain other organic materials it may combine or react with explosive force. But the instances of materials containing no oxygen burning in the presence of chlorine gas alone are indeed rare. We believe this question should be answered "False."

Answer 28. The capacity of a CO_2 extinguisher is not ascertained by weighing, but the quantity of extinguishing liquid (or gas) is so ascertained. The capacity of the extinguisher is indicated on the extinguisher itself. This question should be answered "False."

Answer 29. True.

Answer 30. True, from the standpoint of preventing extension of fires. For extinguishing fire, automatic sprinklers are most effective in the majority of cases.

Answer 31. True.

Answer 32. True.

Answer 33. High grade anthracite is not subject to spontaneous ignition, but low grades of anthracite may occasionally heat spontaneously. However, we believe this question should be answered "False."

Answer 34. False. Carbon tetrachloride is non-combustible, and therefore will not burn.

Answer 35. True. The solution is diluted to a point where the mixture will not support combustion.

Answer 36. False.

Salford, Eng., Adopts American Type Ladders

The frontispiece of the Fifth Annual Report of the Salford, Eng., Fire Department, Chief Fire Officer A. A. Ashton, K. M., shows firefighters "erecting a specially designed 50′ ladder (the only one in size in the North of England)" which bears striking resemblance to the modern three-section metal extension ladder popular in this country.

In the period April 1, 1952, to March 31, 1953, the Department responded to 903 calls of which 18 were malicious false alarms and 77 "false alarms." Fire losses were approximately £130,000 on property valued at £6,000,000.

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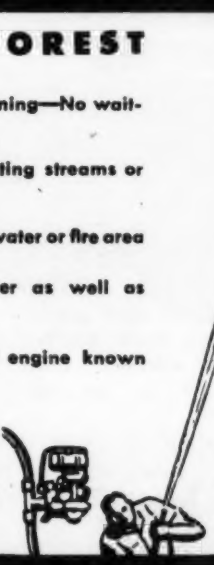

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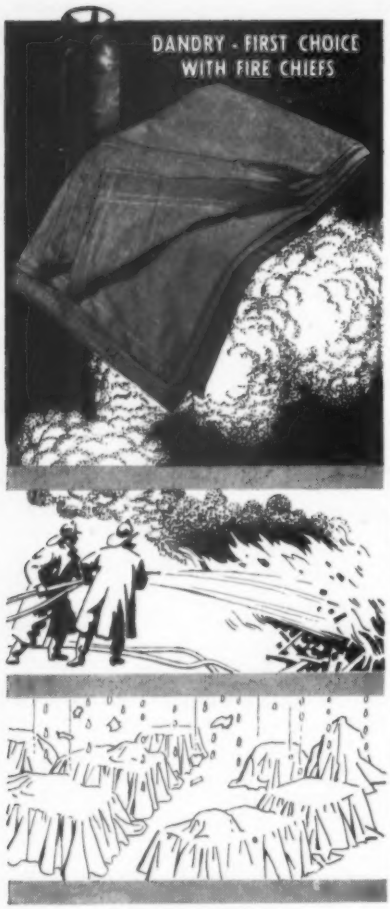

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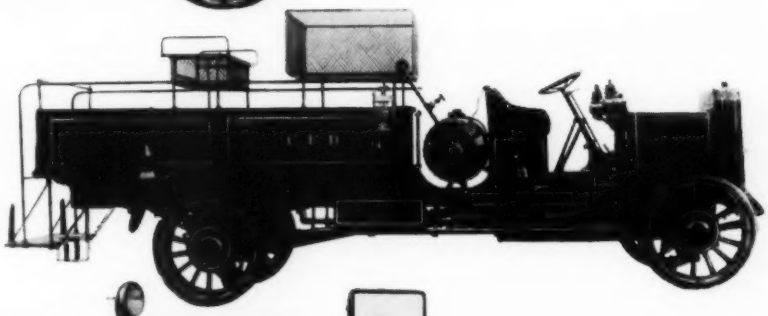
CHICAGO

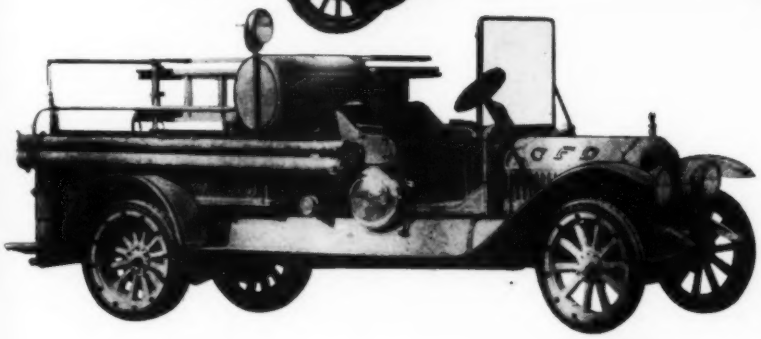
1907

27 Pirsch Horse Drawn Hose Wagons built for Chicago.



1912

3 Pirsch equipped motorized chemical and hose cars; first motorized apparatus in Chicago Fire Dept.



1916

2 Pirsch equipped 600-gallon pumpers.

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